

CITY OF BOSTON  PRINTING DEPARTMENT



ANNUAL REPORT
OF THE
PUBLIC WORKS DEPARTMENT
FOR THE
YEAR ENDING DECEMBER 31, 1950.

Boston, January 2, 1951.

HON. JOHN B. HYNES,
Mayor of Boston.

DEAR MR. MAYOR:

In compliance with the provisions of section 24 of chapter 3 of the Revised Ordinances of 1947, I respectfully submit the Annual Report of the Public Works Department for the year ending December 31, 1950.

I took the oath of office as Commissioner on January 3, after an absence of five years. Immediately upon starting my second term, I recognized that it would be necessary to effect many changes to recreate a high standard of integrity, service, and efficiency.

NEW DIVISIONS.

Acting in accordance with the provisions of section 33 of chapter 27 of the Revised Ordinances of 1947, the Bridge and Ferry Division and the Highway Division were combined into a single division, to be known as the Bridge and Highway Division, effective May 15, 1950. The new division combines all the work, duties, and responsibilities that came under the jurisdiction of the two (2) divisions at the time of the merger.

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The Automotive Division was created, effective February 8, 1950. This division is responsible for the care, control, and maintenance of all department-owned vehicles. All department garages, gasoline pumps, and related properties are also placed under the jurisdiction of this division.

The division in its first year of operation has been operated very efficiently. It is well said that a Public Works Department operates on wheels and that the proper care of its vehicles is one of the most important functions that such a department can perform. Prior to the establishment of the automotive section of the department as a separate division, it operated as a subdivision of the Highway Division and, in my opinion, did not receive the recognition that this important unit warrants.

It now receives the full attention of a Division Engineer who has systematized the work of the division, and has introduced businesslike methods in providing for an adequate inventory control and a regular check on all motor vehicles to insure proper maintenance and operation.

STREET PAVING INVESTIGATION.

The Boston Finance Commission conducted an investigation into the street paving program of the previous administration that exposed many shortcomings and brought disrepute to the department. As a result of the exposé of the Finance Commission, I found it necessary to reorganize the Highway Division and institute reforms in contract highway construction work that would guarantee to the taxpayer 100 cents of value for every dollar of expenditure.

Many major changes were made in our highway specifications, the most important of which provided for a change in the method of payment for the work done. Theretofore the department paid for highway work on a square yard basis for a minimum depth as required by the specifications. In its investigation the Finance Commission found many instances of inadequate pavement thicknesses, although the contractors were paid in full, per square yard of pavement laid. Under the circumstances, the department was paying for materials not furnished.

In order to eliminate the possibility of the recurrence of any such condition, we adopted a method of paying

contractors for the actual weight of materials furnished, on a tonnage basis. The contractor is now paid up to a specified maximum only for actual material furnished at the site, although in all cases the contractor is required to furnish a specified minimum depth of pavement material. If, however, the contractor fails to provide the minimum depth, he is not given full payment, which was the old method on the square yard basis. Under our new system, as stated hereinbefore, he is paid only for materials actually furnished, based on certified weight slips, issued at the point of origin by a representative of the department.

In order to provide for an additional check on payments made to contractors and also to insure adherence to specifications, I created the so-called Finals Section in the Highway Division. This section, under the direction of a so-called Finals Engineer, determines the final quantities to be paid on all highway contracts and makes its investigations and determinations independent of the engineers assigned to a project during its construction. All final estimates must be approved by the Finals Engineer before processing them for payment. Before any final estimates are paid, the Finals Engineer removes cores from all finished pavements in order to inspect and check on the actual depths of pavement materials laid.

With the addition of the Finals Section, coupled with the removal of cores from finished pavements and the adoption of the tonnage method of paying for street construction work, I feel that we now have a positive check on all work done by contractors. The adding of the Finals Section to the Highway Division has, in my opinion, done more to insure adherence to contract specifications on highway work than any other single factor. In its first year it has proved conclusively that it is of inestimable value to the department.

CONTRACT CANCELLATIONS AND RENEGOTIATIONS.

Early in the year the Law Department questioned the validity of the contracts entered into by the previous administration for the disposal, collection, and removal of garbage and refuse. Therefore, I held conferences with all the contractors involved and renegotiated their contracts at a saving to the City of \$67,406.49.

In addition to the latter-referenced substantial saving, the City awarded contracts in December for the dis-

posal, collection, and removal of refuse for the year 1951, in the amount of \$193,367.92 less than similar contracts awarded in December of 1949 by the previous administration and covering the year of 1950. This is an unusually large reduction in cost over the contracts that were awarded by the previous administration, particularly when you take into consideration that the refuse collection contractors were required to pay 12 cents per hour more for labor in 1951 than during 1950. This 12-cent an hour increase amounts to an additional cost of approximately \$80,000 to the collection contractors.

The total cost of contracts for this important service as awarded by the previous administration for the year 1950 was \$2,805,425.52, as compared with a total cost of \$2,612,057.60 for similar contracts awarded by this administration for 1951.

A contract, without publicly advertising for bids, was awarded by the previous administration under date of December 27, 1949, in the amount of \$77,550, for relaying granite block pavement in designated streets. In the letter of "authority to award" that was sent to his Honor the Mayor, under date of November 1 of 1949, by the previous Commissioner, the principal reason advanced for awarding the contract without publicly advertising for proposals was that "present conditions constitute a danger that may cause personal injuries and because of that fact there is an immediate need for the resurfacing of the pavements in these locations." In that no work had been done on the contract up to March of 1950, the above-described reason could not be considered a factor, and, in my opinion, the contract was automatically nullified.

However, I made a personal survey of the streets listed in the contract in order to obtain firsthand information of their condition. I found that the streets listed in the contract were not in a dangerous condition and that, in most cases, there was no necessity of resurfacing them. I also found that one of the streets in which the granite block was to be relaid was already surfaced with sheet asphalt that was in good condition.

Therefore, under date of March 16 of 1950, I canceled the contract.

Under date of December 30, 1949, the previous administration awarded a contract, in the amount

TABLE SHOWING LENGTH AND AREA OF PAVING ON ACCEPTED STREETS, CORRECTED TO JANUARY 1, 1951.

LENGTH IN MILES.												AREA IN SQUARE YARDS.											
	Sheet Asphalt.	Asphalt Concrete.	Granite Block.	Wood Block.	Plank on Bridges.	Brick.	Con- crete.	Macadam	Gravel.	Not Graded.	Totals.	Sheet Asphalt.	Asphalt Concrete.	Granite Block.	Wood Block.	Plank on Bridges.	Brick.	Concrete.	Macadam.	Gravel.	Not Graded.	Totals	
Year 1949 Report.....	*228.40	†220.65	‡56.40	0.47	0.55	0.60	§24.30	‡176.67	11.75	0.84	720.63	*4,587,412	†4,128,738	‡1,486,157	8,840	12,740	13,251	‡478,604	‡2,864,228	179,092	29,425	13,788,487	
Per Cent.....	31.69	30.62	7.82	0.07	0.08	0.08	3.37	24.32	1.63	0.12	100.00	33.27	29.95	10.78	0.06	0.09	0.10	3.47	20.77	1.30	0.21	100.00	
JANUARY 1, 1951.																							
City Proper.....	47.73	24.93	16.04	0.22	0.10	0.40	3.04	3.66	0.26	.....	96.38	1,046,935	543,164	358,038	2,679	3,623	6,308	99,686	58,684	1,794	.....	2,120,911
Charlestown.....	4.91	4.59	6.73	0.08	0.05	.....	0.88	5.46	.....	0.01	22.71	97,677	75,600	171,033	2,011	1,701	.....	15,474	73,882	.....	41	442,419
East Boston.....	5.85	11.76	4.88	0.01	0.05	0.04	0.44	12.84	0.24	0.04	36.15	135,130	238,441	115,643	325	777	771	25,280	277,359	4,576	865	798,867	
South Boston.....	12.57	11.04	8.47	0.04	0.06	0.02	0.53	10.60	0.09	0.50	43.92	267,251	209,616	245,362	1,134	1,737	1,386	17,287	177,036	1,024	15,754	937,587	
Roxbury.....	40.76	24.33	5.71	0.05	.....	0.14	6.31	16.35	0.36	0.00	94.01	798,770	441,010	130,651	933	.....	4,530	105,972	236,951	5,403	27	1,724,247
West Roxbury.....	43.11	49.96	3.00	.....	0.07	.....	4.53	45.10	2.28	0.00	148.05	741,050	892,400	129,048	.....	1,340	.....	63,461	709,853	35,121	5,390	2,577,663
Dorchester.....	58.30	58.56	1.84	0.06	0.05	0.01	6.08	44.08	1.62	0.02	170.62	1,118,343	1,083,369	58,803	1,069	889	145	98,528	688,860	22,931	1,737	3,075,274	
Brighton.....	22.01	27.67	0.46	.....	0.08	.....	1.23	13.14	0.39	.....	64.98	490,741	519,848	45,214	.....	1,231	.....	30,415	213,255	5,888	50	1,306,642
Hyde Park.....	9.29	10.25	0.04	0.01	0.05	.....	0.64	19.83	5.54	0.24	45.89	171,465	215,870	7,161	186	702	.....	10,119	332,405	86,702	5,080	829,690
Totals.....	244.53	223.09	47.17	0.47	0.51	0.61	23.68	171.06	10.78	0.81	722.71	4,867,362	4,219,018	1,263,953	8,937	12,000	13,140	466,222	2,770,285	163,439	28,944	13,813,300	
Per Cent.....	33.84	30.87	6.53	0.06	0.07	0.08	3.28	23.67	1.49	0.11	100.00	35.24	30.54	9.15	0.06	0.09	0.09	3.38	20.06	1.18	0.21	100.00	

TOTAL PUBLIC STREETS 722.71 MILES.

NOTE.—In the above table the city is subdivided substantially on the boundary lines between the districts as they existed when annexed to Boston. Territory annexed from Brookline included in City Proper.

*Of this amount 0.09 mile or 810 square yards is Biturock; and 0.002 mile or 310 square yards is Unionite.

†Of this amount 0.02 mile or 202 square yards is cobble; and 28.85 miles or 927,325 square yards is granite block paving on concrete base.

‡Of this amount 0.06 mile or 465 square yards is Blome granitoid concrete block.

§Of this amount 145.66 miles or 2,385,849 square yards is bituminous macadam.

†Of this amount 131.35 miles or 2,368,648 square yards is asphalt concrete; and 85.81 miles or 1,728,957 square yards is Bitulithic; and 4.06 miles or 67,505 square yards is Topeka; and 0.06 mile or 942 square yards is Filbartine; and 0.11 miles or 2,914 square yards is Simasco; and 0.03 mile or 595 square yards is Carey Elastite Asphalt Plank; and 0.06 mile or 518 square yards is John-Manville Asphalt Plank; and 1.61 miles or 48,939 square yards is tar concrete.

6.67 miles or 35,456 square yards public alleys included in this table; 7.55 miles or 335,325 square yards public streets in charge of Park Department included in this table; 7.58 miles or 254,210 square yards public streets in charge of Commonwealth of Massachusetts included in this table. In addition to this table there are 2.22 miles or 10,804 square yards of accepted footways.

of \$25,215.00, for constructing a concrete sewer overflow in private land adjacent to Border street, East Boston, in the vicinity of Decatur street. Upon investigation, I found that we already had an overflow in this area located about 70 feet north of the line of the proposed new overflow. I also found that the land in which the overflow was located was to be used as an oil farm, and it was the desire of the owners or operators of the oil farm to have the overflow relocated. However, we had easement rights in the land, and if the overflow were to be relocated, the expense, in my opinion, should have been assumed by the owner or lessee of the property. In view of this, I notified the attorney for the lessee to that effect, and told him that the City would not construct a new overflow unless the cost of same were paid by the lessee or owner of the property. As we could not come to any agreement concerning this matter, I canceled the contract by the payment of \$358 to the contractor for his expenses in connection with the cost of the bond and other related services. Therefore, the canceling of this contract resulted in a net saving of \$24,957 to the City, and also served to keep an oil farm out of a heavily populated section of East Boston.

STREET CONSTRUCTION WORK

State-Aid Program.

Last year we completed the largest chapter 90 State-Aid Highway Reconstruction Program in the history of the City. The following important main highways were reconstructed during the year under this program:

Columbia Road, from Edward Everett square to Blue Hill avenue.

Blue Hill Avenue, from Grove Hall to American Legion Highway.

Western Avenue, Brighton, from Soldiers Field road to Market street.

Beacon Street, from the Brookline line to Park Drive.

The cost of the above-referenced projects totaled approximately \$528,000, of which the State Highway Department, under the provisions of section 34 of chapter 90 of the General Laws, paid one half, thereby resulting in a substantial saving to the taxpayers of this City.

In addition to the above-referenced projects, chapter 90 contracts for the reconstruction of Centre street, Jamaica Plain, from the Arborway to Weld street, and for the reconstruction of River street, Dorchester, from Mattapan square to Dorchester Lower Mills, were awarded in the latter part of the year, and it is expected that work will start on them early in the spring of 1951. The cost of the latter two-referenced projects will total approximately \$150,000.

Non-State-Aid Program.

We also completed a major street reconstruction program in the downtown section involving four (4) miles of streets, at an estimated cost of \$220,000. Most of the work was done during the nighttime and over weekends, so as not to inconvenience the motorists and businessmen in the downtown area.

In addition to work on the downtown streets, the department constructed and reconstructed streets in every section of the City. The important arteries that were resurfaced, in addition to those done as chapter 90 projects, are as follows:

Albany street, from Broadway to Massachusetts avenue, 5,695 feet.

Blue Hill avenue, from Dudley street to Grove Hall, 6,182 feet.

Washington street, Dorchester, from Grove Hall to Codman square, 7,651 feet.

Boston street, from a point near Andrew square to Edward Everett square, 2,729 feet.

Warren street, Roxbury, from Dudley street to Grove Hall, 7,221 feet.

St. James avenue, City Proper, from Arlington street to Berkeley street, 632 feet.

A major start was also made on the replacing of brick sidewalks with cement concrete in the Charlestown, East Boston, and South Boston districts. During the year contracts totaling approximately \$70,000 were awarded for the removal of the old, outmoded, brick sidewalks in the above-referenced three sections of the City.

The following is a summarized financial statement of the expenditures made in 1950 for highway improvements:

Budgetary Item.

Public Ways, Construction of (Loan Account)	\$1,937,386 42
Public Ways, Construction of (Revenue Account)	158,890 82
Reconstruction of Streets (including sidewalks)	106,976 44
Sidewalks, Construction and Reconstruction of	66,945 31
Total	<u>\$2,270,199 02</u>

The following is a summarized record of the highway improvement work done by the department in 1950:

Number of Streets Constructed or Reconstructed, 138.

Includes 21 new streets ordered laid out and constructed by the Board of Street Commissioners under the provisions of chapter 393 of the Acts of 1906.

Miles of Streets Improved, 29.23.

Includes 4.01 miles of so-called chapter 90 — state-aid highway improvements.

Miles of Sidewalks Improved, 6.98.

In addition to sidewalk improvements included in above-noted street improvements.

We also completed during the year, the removal of the largest number of street gas lamps in the history of the department. We replaced approximately 1,200 gas lamps with modern, electric lights, and it is our intention to continue with this program and remove 1,500 additional ones in 1951.

SNOW REMOVAL.

During the year of 1950 we were fortunate that no blizzards or heavy snowstorms occurred. The department experienced no difficulty in keeping the streets properly plowed and sanded throughout the winter months. We use a great deal of rock salt, particularly in the downtown streets, in order to prevent the bonding of snow to the pavement surfaces, and also to assist in the melting of snow. We used approximately 3,000 tons of salt and 7,000 tons of sand on snow plowing and removal work. The department owns fourteen (14) Walter Snow Fighters which are used to plow, sand and salt the streets in the downtown area. Most of the plowing work in the rest of the City is done by 240 trucks rented on an hourly basis from contractors.

At the present time there are 720 miles of public streets that have to be plowed and maintained during the winter months.

The cost of snow removal work in 1950 totaled \$392,247.12. The average yearly cost from 1946 to 1949, inclusive, was \$747,885.37.

FERRY SERVICE.

As authorized by a Council order of April 3, the ferryboat "Ralph J. Palumbo" was sold at public auction at an established upset price of \$22,500 to the only bidder, the Delaware River Ferry Company of Chester, Pennsylvania. The disposal of this boat has not in any way affected the service that we maintain in connection with the operation of the ferry, although it will result in an annual saving of approximately \$26,000. This boat was built in 1930 and first named the "General Sumner." The name was changed in 1935 to the "Ralph J. Palumbo."

MERIDIAN STREET BRIDGE.

During the year we were successful in obtaining a six-month extension from the War Department in connection with the removal of the old structure. In this six-month interval, we were also successful in having His Excellency the Governor and the State Department of Public Works agree to contribute \$1,000,000 of state money to the construction of the new bridge, which was estimated, at that time, to cost \$3,000,000. The removal of the old structure was started in July and was completed in December. It is expected that contracts for the construction of the new bridge will be advertised sometime in February.

BOSTON CENTRAL ARTERY.

Two contracts, totaling \$1,412,000, were awarded in the latter part of the year by the State Department of Public Works for the construction of a bridge spanning the Charles River, near the North Station, and which is to serve as a connection between the Central Artery and the Mystic River Bridge. The state department expects to advertise the next contract for the Central Artery in March. This contract will provide for the construction of that part of the artery extending from Haymarket square to the above-referenced Charles

River Bridge. The state has already allotted to the Central Artery, \$30,000,000 out of the first \$100,000,000 bond issue. A second \$30,000,000 has also been tentatively allocated out of the second \$100,000,000 bond issue, thereby making available for the construction of the Central Artery the total sum of \$60,000,000.

GARBAGE DISPOSAL.

Heretofore, the garbage collected in the Dorchester, Elm Hill, and South Boston sections has been hauled by trucks to the Victory road receiving station and dumped into a scow and hauled to Spectacle Island, and then taken to the land dump for final disposition. However, in November, publicly advertised proposals were requested for the sale, to hog farmers, of garbage hauled to Victory road. These were opened on October 25, and the contract was subsequently awarded to the highest responsible bidder, Kennedy Brothers of Waltham, who agreed to purchase the garbage at a price of \$36,000 a year for a three-year period. The garbage will be hauled to Victory road, as heretofore, but instead of dumping it into the scow, it will be dumped directly into large tractor-trailer units of the hog raiser, and then hauled by the hog raiser to his farm in Waltham.

As the Coleman Disposal Company will not be required to haul the garbage from Victory road to Spectacle Island in 1951, I have been successful in obtaining a reduction of \$22,000 per year in the disposal contract due to this change in the garbage disposal system. Therefore, the net result of selling this garbage to Kennedy Brothers is a saving of \$58,000 per year to the City.

Incidentally, the Coleman Disposal Company contract awarded by the previous administration for the year 1950 was in the amount of \$581,807, whereas a similar contract for the year 1951, awarded by the present administration, totaled \$530,000, or a net annual saving to the City of \$51,807.

PROBLEM AFFECTING THE DISPOSAL OF GARBAGE AND REFUSE.

One of the most important problems concerning the department is the one involving the sanitary and economical disposal of garbage and refuse. The present system provides for the disposal at interior land dumps

and on Spectacle Island in Boston Harbor of part of the garbage and all of the refuse collected in the City. This system — which has been reasonably satisfactory up to the present time — is fast approaching the danger point, and a new method must be adopted in the immediate future to insure adequate and sanitary refuse disposal facilities for the next twenty or thirty years. Practically all available land dumps in this City are being filled rapidly, including the vast dumping area located on the so-called Calf Pasture site in Dorchester. With the construction of Boston College High School and the proposed construction of a housing development in this area, I do not believe that we shall be able to use it as a dumping site beyond January 1, 1953. It is my opinion that this area should be discontinued as a refuse dump as soon as possible. Land dumps, at best, are unsightly and, in general, constitute a nuisance. The trend in modern cities is to abandon the system of dumping refuse on low tracts of land and to adopt incineration which, in my opinion, is the only completely satisfactory method of garbage and refuse disposal available for the greater part of Boston.

While there has been a great deal of talk about incineration for Boston during the past twenty years, very little has been done to bring about this desired change in our refuse disposal system. Incineration of refuse is not in the experimental stage. It has been used successfully and satisfactorily by municipalities for over thirty years. In order to provide for a completely thorough and up-to-date study of this entire problem, a contract was awarded to the consulting engineering firm of Thomas Worcester, Inc., under date of August 14, 1950, at a maximum fee of \$9,500. This report will be ready some time in March or April of 1951, and I am hopeful that it will be beneficial in recommending an adequate and sanitary method of garbage and refuse disposal that will meet the needs of the City for the next thirty (30) years.

SEWAGE TREATMENT PLANT.

Under the provisions of chapter 598 of 1949, the City of Boston was required to start construction on the new sewage treatment plant at Calf Pasture not later than April 1 of 1950, and is required to complete the whole project prior to July 1 of 1955. To provide funds to pay

for this desired improvement, the City was authorized to borrow up to \$12,000,000. While a token start was made on the project prior to the above-referenced April 1 date, nothing further has been done because of the unavailability of appropriations, coupled with the fact that we do not agree with the design which provides for construction of the treatment plant adjacent to the Calf Pasture Pumping Station.

During the year we have been negotiating with the Metropolitan District Commission concerning the construction of the treatment plant, and serious thought has been given to having the Metropolitan District Commission take over the Boston main drainage system and construct an enlarged treatment plant at Deer Island to provide for the treatment of sewage from the North Metropolitan district, and also from the Boston main drainage system. If this plan is adopted, it will provide for the complete elimination of the Calf Pasture Pumping Station and the sewage works at Moon Island, including the abandonment of the tunnel that is located under Dorchester Bay, between Calf Pasture and Moon Island.

MISCELLANEOUS.

Mobile Patrol.

In November a new system was established to provide efficient and economical watchmen's services for the various district yards and properties of the department. This new unit is known as the Mobile Patrol, and it has superseded the old system of having watchmen assigned to various yards. The patrol operates on a route system comprised of five different routes. It has worked out very satisfactorily, and it is my intention to have it adopted permanently and placed under the jurisdiction of the Automotive Division. It is estimated that the Mobile Patrol will effect a saving in excess of \$100,000 a year for the department.

Purchase of Equipment.

During the year the department purchased eight (8) Trojan front-end loaders for use in loading sand, salt, and snow, and for the general year-round use of the district maintenance forces in the Highway Service. They have already proved to be a success, and the district foremen are very pleased with the unit. It is mounted on pneumatic tires and provides the flexi-

bility of operation that is lacking in the slow and cumbersome caterpillar-type unit.

For the first time in ten years, we purchased two (2) modern, 2,000-gallon street cleaning flushers. Flushing of streets is the modern way of insuring clean, sanitary, roadway areas.

We supplemented our fleet of twenty-one (21) street cleaning machines by the purchase of three (3) large-type Elgin sweepers, and one (1) Wayne sweeper. This is the first time that we have purchased a Wayne sweeper, and I am pleased to report that it has proved satisfactory in every respect.

Sale of Junk and Outmoded Equipment.

A public auction was held on May 22 and May 23 in the various district yards, for the purpose of selling all junk and outmoded equipment that had been cluttering the yards for years. While it was estimated that we would obtain about \$4,000 from the sale, we were agreeably surprised to find that the auction netted \$13,127.64. It was capably conducted by Eugene F. Canney, contract clerk in the department.

New District Yards.

Due to the construction of the new Fire Headquarters on Southampton street, the District 1, South Boston paving yard, was moved to the Atkinson street yard, and now occupies the latter area with the maintenance forces of the Bridge Division.

As there was no yard in the South Boston district for the use of the street cleaning and sanitary forces, we acquired, for such a purpose, from the Board of Real Estate Commissioners, a piece of land containing 16,500 square feet and located at 175 to 179 West First street. The contract for the foundation of the office building was awarded to F. C. Dolan and Sons in October, in the amount of \$3,487.50.

Master Highway Plan.

A contract in the amount of \$58,000 was awarded to the consulting engineering firm of Charles A. Maguire and Associates, under date of October 18, for the development of a master highway plan for Boston. The purpose of the study is to provide the department with a five (5) year street improvement program and a report on any and all matters affecting highways within the corporate limits of the City.

LOAN ORDERS.

Under date of May 9, 1950, a City Council order was approved by your Honor which provided, under the provisions of section 7 of chapter 44 of the General Laws, that the sum of \$2,000,000 be appropriated for the Construction of Public Ways. This is the so-called "Public Ways, Construction of" loan.

No loan order was requested for sewerage works nor for bridge construction, as we had sufficient money in both accounts for the construction work contemplated in the Sewer and Bridge Sections of the department.

FISCAL.

The total expenditures of the department for the year were \$18,042,000, of which \$1,661,000 represents water assessments levied by the Metropolitan District Commission, and \$565,000 represents Metropolitan District Commission sewer assessments.

The receipts of the Water Division totaled \$4,714,700, and the revenue derived from the operation of the Sumner Tunnel reached a new high of \$1,863,000.

The surplus resulting from the sale of water amounted to \$320,072.61, and the operation of the Sumner Tunnel resulted in a record-breaking surplus of \$598,904.14.

The East Boston Ferry has operated at an annual deficit over the years, but I am pleased to report that the deficit for 1950 was \$53,859.31 less than the deficit in 1949. In 1949 the deficit totaled \$349,417.39, and in 1950, \$295,558.08.

PERSONNEL.

There were 2,435 employees in the department as of December 31, as compared with 2,465 employees on January 1, 1950.

Appended hereto are reports submitted by the Division Engineers relative to the activities of their divisions in 1950.

Respectfully submitted,

GEORGE G. HYLAND,
Commissioner of Public Works.

The records of the department show that there are now 2,435 persons eligible for employment in the several divisions, and of that number 2,405 were upon the January, 1951, payrolls.

Grade and Number of Employees.

TITLE.	SERVICES.									
	Central Office.	Paving and Lighting.	Sewer.	Sanitary.	Street Cleaning.	Bridge.	Ferry.	Tunnel.	Water.	Automotive.
Commissioner.....	1									
Division engineers.....	1	1	1						1	1
Assistant engineers (civil).....	21	32				10			4	
Draftsman.....									1	
Transitmen.....	6	7				1			1	
Rodmen.....	12	5				3			3	
Blueprinters.....			2							
Superintendents.....								1	1	2
Chief supervisor.....				1						
Supervisors.....	2			1		1				2
General foremen.....	1	1							1	
Foremen.....	13	7	17	14	1			1	7	1
Chief inspectors.....	1	2								
Inspectors-subforemen.....	66	15	41	35	4			1	17	1
Executive secretaries and secretary.....	1	1							1	
Chief clerks.....	1	1	2						2	1
Executive clerks.....	1					1			1	
Clerks-stenographers.....	12	20	11	9	1	3		9	60	8
Telephone operator.....				1						
Cashiers and assistants.....							1	1	1	
Storekeepers.....				1			1			1
Medical director and nurse.....	2									
Captains.....							4			
Quartermaster-pilots.....							3			
Deckhands.....							6			
Dispatcher.....										1
Investigators.....	1	1							3	
Matrons.....							4			
Engineers (steam).....	6	6					4	17		1
<i>Carried forward.....</i>	16	153	91	74	50	24	23	30	104	19

Grade and Number of Employees. — Concluded.

SERVICES.

TITLE.	Central Office.	Paving and Lighting.	Sewer.	Sanitary.	Street Cleaning.	Bridge.	Ferry.	Tunnel.	Water.	Automotive.	Total.
<i>Brought forward</i>	16	153	91	74	50	24	23	30	104	19	584
Oilers.....			3				4				7
Firemen.....			8				14				22
Gate-men-tollmen-guards.....							15	44			59
Sergeant-tollmen-guards.....								4			4
Gate-men-filth hoisters.....			10								10
Chief and meter readers.....									41		41
Drawtenders and assistants.....						152					152
Chief and electricians.....			2			1					3
Motor equipment maintenance man.....										1	1
Master mechanics.....			1	4			1		5	5	16
Auto mechanic-repairers.....		3	3	2						31	39
Blacksmiths-horseshoers.....		5	1	12							18
Carpenters-joiners.....		4	2	3		12	2				23
Harnessmaker and assistant.....				2							2
Machinists.....			3			2	3	3	20		31
Painters.....		5		8		3				2	18
Asphalt rakers.....		13									13
Pavers.....		16				1					17
Plumbers-pipefitters.....									150		150
Boilermakers.....			1				1				2
Sewer cleaners-flushers.....			29								29
Catch-basin cleaning machine operators.....			7								7
Stonecutters-brick masons.....		4	3	1					1		9
Wheelwrights and assistants.....				2							2
Head chauffeurs.....										5	5
Machine operators.....		4		6	24					1	35
Chauffeurs, etc.....		43	34	18	113	6		12	41	23	290
Working foremen, laborers, etc.....		5	2		2	3		1	1		14
Laborers, teamsters, etc.....		180	29	39	417	6	6	9	85	11	782
Wharfinger.....				1							1
Yardmen and yardmasters.....		3	4	2	1	1			4		15
Constables.....					25				9		34
Totals.....	16	438	233	174	632	211	69	103	461	98	2,435

Number of Employees Actually Employed January 1, 1950, and January 1, 1951.

	Tunnel.	Central Office.	Bridge.	Ferry.	Water.	Paving and Lighting.	Sanitary.	Street Cleaning.	Sewer.	Automotive.	Total.
January 1, 1950..	100	15	214	74	462	480	256	605	235	.....	2,441
January 1, 1951..	100	16	210	65	456	435	170	625	230	98	2,405

Total Eligible Force.

January 1, 1950..	102	15	217	75	465	486	260	610	237	.....	2,467
January 1, 1951..	103	16	211	69	461	438	174	632	233	98	2,435

Appointments, Transfers, Resignations, Retirements, Deaths, etc., of Employees.

Died.	Retired.	Transferred to Other Departments.	Transferred to Other Services.	Discharged.	Resigned.	January 1, 1950.	SERVICES, 1950-1951.	January 1, 1951.	Transferred from Other Services.	Transferred from Other Departments.	Reinstated.	Appointed.
....	1	.....	.....	.....	.....	15	Central Office..	16	1	.....	.....	1
4	5	.....	.....	.....	2	217	Bridge.....	211	2	.....	1	2
....	3	.....	5	.....	.....	75	Ferry.....	69	.....	.....	1	1
3	10	2	75	2	4	486	Paving.....	438	18	9	7	14
2	11	.....	88	1	1	260	Sanitary.....	174	10	1	.....	6
11	8	3	18	23	5	610	Street Cleaning	632	72	1	1	16
5	5	1	8	....	2	237	Sewer.....	233	3	3	1	10
5	12	2	15	10	8	465	Water.....	461	7	6	....	35
1	....	.....	2	.....	.....	102	Tunnel.....	103	2	.....	.....	2
2	1	3	8	.....	.....	.....	Automotive...	98	104	2	....	6
33	56	11	219	36	22	2,467	Totals.....	2,435	219	22	11	93

MAINTENANCE APPROPRIATIONS AND EXPENDITURES.

DIVISION OR SERVICE.	Total Appropriations, Including Transfers.	Expenditures.	Unexpended Balance.
Central Office . . .	\$48,689 00	\$44,449 95	\$4,239 05
Automotive Division . . .	474,441 13	451,636 36	22,804 77
Bridge Service . . .	740,889 84	716,270 39	24,619 45
Ferry Service . . .	380,046 47	342,872 45	37,174 02
Tunnel Service . . .	476,329 90	461,404 93	14,924 97
Lighting Service . . .	1,162,460 86	1,152,599 49	9,861 37
Paving Service . . .	1,243,484 00	1,233,367 29	10,116 71
Sanitary Division . . .	5,127,863 00	5,098,726 84	29,136 16
Sewer Division . . .	734,681 27	727,438 95	7,242 32
Water Division . . .	2,540,825 00	2,349,060 88	191,764 12
Workmen's Compensation Service . . .	26,259 00	26,101 04	158 56
Totals . . .	\$12,955,969 47	\$12,603,928 57	\$352,041 50

Expenditures from Special Appropriations, etc.

Bridges, Construction of (non-revenue)	\$32,727 42
Bridges, Repairs, etc. (revenue)	241,934 20
Reconstruction of Streets (revenue)	106,976 44
Sidewalks, Construction and Reconstruction of (revenue),	66,945 34
Street Signs (revenue)	8,354 09
Public Ways, Construction of (revenue)	158,890 82
Public Ways, Construction of (non-revenue)	1,937,386 42
Snow Removal (revenue)	392,247 12
Sewerage Works (revenue)	22,093 76
Sewerage Works (non-revenue)	545,782 43
Total	<u>\$3,513,338 04</u>

REVENUE.

On Account of Public Works Department.

Central Office:		
Sale of plans, etc.	\$1,802 00	\$1,802 00
Bridge Service:		
Chelsea South Bridge	\$182 50	
Rents	3,480 00	
Meridian Street Bridge	18,269 00	
Chelsea North Bridge	18,536 83	
Charlestown Bridge	319 68	
Summer Street Bridge	1,183 92	
Dover Street Bridge	592 55	
		42,564 48
Ferry Service:		
Tolls	\$24,433 71	
Rents	120 00	
Cleaning telephone booths	24 00	
Commission on telephones	25 31	
Sale of boat	22,500 00	
Refunds	73 00	
		47,176 02
Sumner Tunnel:		
Tolls	\$1,862,035 00	
Rents	1,000 00	
		1,863,035 00
Lighting Service:		
Damage to posts	\$21 90	
		21 90
Paving Service:		
From assessments on abutters for cost of laying sidewalks in front of their premises, including material for same:		
Assessments added to taxes	\$370 72	
Permits	29,181 16	
Labor and materials furnished	136 50	
Junk	706 99	
Rents	410 00	
Damage to property	25 00	
Refunds	6 78	
		30,837 15
Sewer Service:		
Disposal of sewage	\$19,233 00	
Labor and materials furnished	150 00	
Entrance fees	937 16	
Junk	97 35	
Rents	120 00	
Refunds	114 54	
Damage to property	5,225 00	
Sale of material	1,169 26	
		27,046 31
Sanitary Service:		
Collection of commercial waste	\$4,421 20	
Sale of junk	129 01	
Refunds	60 00	
Damage to property	114 00	
		4,724 21
Carried forward		\$2,017,207 07

PART II.
APPENDICES.

APPENDIX A.

REPORT OF THE DIVISION ENGINEER OF
THE AUTOMOTIVE DIVISION.

BOSTON, January 2, 1951.

To the Commissioner of Public Works.

DEAR SIR:

The following is the annual report of the Automotive Division, Public Works Department, for the year ending December 31, 1950:

The Automotive Division was created by the Commissioner of Public Works, George G. Hyland, with the approval of his Honor the Mayor, on January 19, 1950, and Mr. J. Leo McGrath was appointed Division Engineer on January 23, 1950. The employees of the various divisions of the Public Works Department engaged in automotive work were transferred, on February 8, 1950, to make up the personnel of the new division. An organizational chart was drawn up, clearly defining the duties and responsibilities of these employees.

The system established was as follows. A perpetual inventory was installed in the stock room, and all articles, in and out of stock, are entered in this inventory. In establishing the perpetual inventory, the Commissioner of Public Works authorized the employment of an expert, employed by the Ford Motor Car Company, to assist in the inventory and the establishing of stock bins, carrying part numbers and prices for each part which becomes part of the stock bin.

It was necessary to purchase additional stock bins in order that, as far as possible, small parts could be placed in these bins, and kept in proper order. In order to accomplish this inventory and set the stock room up in a modern way, it was necessary to carry this work on at night and on Saturdays and Sundays.

In setting up the stock room, a separate section was built to separate tools used in the operation of the shop; and a man is assigned and is held responsible for the dispensing of tools and the return of same by the mechanics working on the floor. The man in charge of

tools has a check, by means of a tag system, controlling the issuing and return of tools from the tool room.

In the receiving and repair of vehicles, the following system has been established. A vehicle, in for repairs, is received by one of three master mechanics who enters it on a work order in duplicate, one copy to remain in the master mechanic's office, the other copy to go to the clerical office for recording by the bookkeeping department in connection with the costs.

This work order lists the work to be done. A mechanic is given this work order, in duplicate. It is then inserted in an isinglass-faced envelope, and the mechanic proceeds to the vehicle for work. After breaking the vehicle down and deciding the necessary parts to be replaced, the mechanic then returns to the master mechanic who issues a stock order on the stock room for the required stock. The mechanic then proceeds to the stock room and draws the stock against the stock order.

The stock order is filed in the stock room and entered on a perpetual inventory card. The signature of the mechanic receiving the stock is acknowledged on the stock order remaining in the stock room. The duplicate of the stock order issued is entered on the work orders by the stock clerk issuing the stock, and he signs the work order, acknowledging delivery of stock to the mechanic assigned, as shown on the work order.

The mechanic returns to the vehicle on which he is working and completes his work. Upon completion of the work, another master mechanic, other than the one issuing the original stock order, verifies that the stock received from the stock room has been placed in the vehicle for repairs, and signs the work order as having completed the final inspection of the work done and stock issued.

Attached to the work order is the time record of the employee working on said vehicle, which becomes part of the permanent cost record to be sent to the office to be charged against the maintenance and repair of the particular vehicle. The work order carries the cost of each item in a column provided for the same, so that the bookkeeping department will have a breakdown of the cost of repairing the particular vehicle, including materials used and labor performed. As far as is possible, this system seems to overcome any previous procedural weaknesses that might have been in the garage service.

The garage, at 280 Highland street, was improved, as follows: With the use of detergents, the garage floor, in its entirety, including the grease stand, was thoroughly scraped, washed, and flushed on four consecutive Saturdays and Sundays, in preparation for painting the floors. The same was done with the locker rooms and toilets. Early in May, and again in September, over long holiday weekends, the garage floor was painted, and sections were marked off, as fire lines, and stalls assigned for repairing of vehicles.

The stock room at 624 Albany street was completely cleaned and painted, and is now used as a stock room for slow-moving parts, tires, tubes, chains, spare motors, etc. The garage at Hancock street was found to be in reasonably fair condition, except for painting the offices, repairing the heater, and supplying a sump pump to take care of spring water.

The garage at Dana avenue, which is under the direction of the Paving Service, was inspected, and the boiler was found to be in need of repairs, and same was done. The office and boiler room at the Dana avenue garage will be painted as soon as is feasible.

The garage at 624 Albany street, which is used for storage of vehicles and dispensing of gasoline and oils, likewise is in reasonably fair condition; and the boiler has been repaired and the boiler room is now in the process of painting. Because of an emergency that existed, his Honor the Mayor allowed an order, under contract, for the removal of the two old 1,000-gallon gas tanks and their replacement with one 2,000-gallon tank.

With the organizing of the Automotive Division, Commissioner of Public Works George G. Hyland included the sale of junk of the Public Works Department as part of the duties of the Automotive Division. In connection with the control of junk, an inventory was taken of obsolete, outmoded equipment and junk that was on hand in the various yards of the Public Works Department.

This list was submitted to the Commissioner of Public Works, and, acting under his orders, public advertising on the sale of this outmoded, obsolete equipment and junk was made in the daily papers and in the *City Record*. The auction sale took place on May 22 and May 23, 1950.

On a previous canvass it was considered that from \$3,000 to \$4,000 might be realized at this sale. The

Commissioner, in his wisdom, felt that more could be realized, and, therefore, ordered the auction sale. The sale brought the surprising amount of \$13,127.64.

The auctioning was conducted by Eugene F. Canney, contract clerk of the Public Works Department, with the assistance of Chief Clerk James C. Strong and Clerk Philip Dickerman of the Automotive Division, under the direction of Division Engineer J. Leo McGrath.

In connection with the improvement and protection of the automotive equipment, it was found that vehicles were not giving the full gasoline mileage expected of them, and the records of the division verified this. Considerable investigation was made to determine how to overcome this loss of gasoline.

Automotive commercial supply houses were contacted for the possibilities of purchasing anti-gasoline theft devices. None was found in the open market that would meet the requirements and, with the approval of the Commissioner of Public Works and Division Engineer Daniel M. Sullivan, the Division Engineer, Mr. McGrath, had William J. Martin, chief machinist of the Water Division and Machinist Adams make patterns for an anti-theft gasoline installation.

All the Ford trucks in the department now have these installations, along with the Dodge trucks. Studies are at present being made to have the same in all other vehicles.

Acting under the orders of the Commissioner of Public Works, as far as is possible with the equipment available in the repair service of the Automotive Division, all repairing of all vehicles and equipment of the Public Works Department is being done by the Automotive Division at the garage at 280 Highland street, Roxbury.

In the conference with the Commissioner of Public Works, in regards to purchasing of additional vehicles and the operation of existing vehicles preparatory to the winter and snow season, the following equipment was ordered, and requisitions were made on the Supply Department for the purchasing of same. Public advertising and opening of bids permitted the following purchases to augment the existing equipment for snow removal:

Eight-Trojan bucket-type loadsters, assigned to the Paving Service, for snow removal around crosswalks, churches, hospitals, etc.

One-Barber-Greene bucket-type loadster, assigned to the Paving Service, to work out of the main sand and salt stock piles in the yard between 624 and 650 Albany street, to expedite the loading of sand and salt on trucks assigned to sanding and salting. The Trojan bucket loadsters will also be of valuable assistance in loading salt and sand from stock piles located in the various district yards.

One-Wagnermobile, assigned to the Sanitary Service, for snow removal (crosswalk work, etc.) in the intown shopping area.

It was further agreed that additional sanders should be provided for sanding and salting work in the various paving district yards and, in this connection, eleven Dodge trucks in the Sanitary Service were transferred to eleven paving districts for winter work, and the dump bodies were removed from same, and Baughman sand bodies were installed, with new Good Roads nine-foot plows installed for plowing duties on these vehicles. These bodies and plows have been mounted and are ready for duty.

The snow removal work was further augmented by the purchase of thirty new plows and the trading of ten old ones, bringing the total number of plows under the inventory of the Sanitary Division to 256, being the number available for contractors and city plow work.

A purchase of two 2,000-gallon street flushing units (with Heil flushing units) was made from the White Motor Company, and, although delivery has not been made, it is expected that early this month will be the best delivery date. The following new equipment was also purchased on requisition by the Supply Department:

Three Elgin sweepers and one Wayne sweeper, making a total of nineteen Elgin sweepers, and one Wayne sweeper of the three cubic yard-capacity type. Of this total of twenty, sixteen are in good working condition; the other four are in questionable condition, and it is my opinion that the cost might prove prohibitive to condition the same. This fleet of sixteen available sweepers is also augmented by five of the smaller type Austin-Western sweepers, one being assigned to the Tunnel Service.

The Paving Service of the Public Works Department was without compressors, and was constantly borrowing from other divisions of the department. Therefore, two compressors of the 160 cubic foot-portable type have been purchased for use in the Paving Service.

A great want was noted for a service truck to be used by the garage for tire repair work outside, minor repair work on vehicles out of service, and some repair work to be completed on the road. A three-quarter ton Ford service truck was purchased, with half-ton hoist and air compressor installed, with necessary tool compartments to carry hydraulic jack, acetylene cutting and welding tools, and portable light to be run on small generator. This truck will give invaluable assistance during the severe winter season in maintaining the equipment on the road.

With the great amount of new street construction and repairs of present streets, seven Chevrolet eight-passenger carryalls were purchased by the Supply Department, on requisitions from the Automotive Division. Six of these carryalls have been assigned to the survey parties of the Paving Division, and one to the survey party of the Bridge Division. These Chevrolet carryalls are new vehicle purchases, thus adding to the present vehicles.

An effort is being made, under the Capital Improvement Program, to replace old vehicles where maximum trading value might be made, or in the case of prohibitive costs for repairs, to trade same. In this connection, various trades were made in the Sewer, Water, and other Divisions and be advised that the trading allowance verified that this was the proper thing to do, as against repairing the vehicles. New vehicles were bought, replacing existing vehicles, for sums varying from \$225, to \$900.

In connection with the improvements in the garage at 280 Highland street, the offices were rebuilt and painted, in order that the clerical forces might have necessary facilities for carrying on their work, and an office was built for the Division Engineer.

In conference with the Commissioner of Public Works, and on recommendation of the Division Engineer of the Automotive Division, it was agreed that a modern telephone and interoffice communication system should be established. The telephone company was contacted through Daniel F. Coughlin, liaison man of the Public Works Department, and the telephone company has installed the very latest automatic dialing interoffice communication and switching system, in the garage service.

This system allows conversations to be made privately, without any interference from any part of the garage on other phones. It is estimated that, with the installation of this system, the cost of telephone service will be decreased one third.

A great need was recognized in establishing a preventive maintenance system in the garage service, and this has partially been accomplished. Garage facilities do not allow a complete preventive maintenance system to be established, and it is hoped, considering war conditions, that when an addition to the existing plant at 280 Highland street is built, to make up for the loss of the garage at 624 Albany street because of the state master highway program, that these facilities will become available, adjacent to the present location.

Insofar as preventive maintenance will allow, vehicles are greased, oil is changed monthly, oil filter cartridges are installed at 10,000 miles, and, when vehicles are on the lift on the grease stand, an inspection is made by mechanics to determine that the brake and steering systems are in safe condition, and, when possible, at that time, if facilities are available in the garage, these repairs, if necessary, are made.

With the advent of the winter season, when vehicles have been in greasing in connection with preventive maintenance, all wiring, distributors, and battery cables have been spread with waterproof solution. In this regard, it is hoped that difficult starting, due to condensation or wet wiring, will be eliminated during the heavy work season of the winter.

Again, in connection with preventive maintenance, a semiannual checkup is made, when all vehicles are inspected for care by the respective drivers, and, where abuse or lack of care is noted, the drivers are instructed to give better care, and cleanliness, and maintenance to their equipment.

For three months, Mr. Moloney of the Municipal Research Bureau, with the approval of his Honor the Mayor, has been conducting a survey in the Automotive Division. Every effort has been made to give this Bureau, through its representative, Mr. Moloney, full cooperation in conducting this survey.

In connection with civilian defense, a complete list of all equipment, tools, etc., under the control of the Automotive Division, has been submitted to Cornelius O'Leary, assigned to this duty in the Public Works

Department. The Automotive Division, I assume, will be called upon to play an important part in civilian defense, and please be advised that we are ready to assist in every detail.

Appended hereto is a report showing the cost of operating and maintaining each and every vehicle in the Public Works Department for the year 1950, broken down on a mileage basis. This report is compiled on the following cost items: labor, overhead, materials, tires and tubes, batteries, outside repairs, gasoline, oil, storage, depreciation, and registration fees.

Very truly yours,

J. LEO McGRATH,
Division Engineer.

REPORT OF COST RECORDS FOR 1950.

AUTOMOTIVE EQUIPMENT.

This report shows the actual cost of the vehicles in the Public Works Department, Automotive Division, for the year ended December 31, 1950. The cost items involved are labor, overhead, material, tires and tubes, batteries, outside repairs, gasoline, oil, storage, depreciation, and registration fees.

Labor.— This item represents the cost of the actual repair time expended on a vehicle by our own mechanics. For the year 1950 the rate was \$1.41 per hour.

Overhead.— This item is made up of an accumulation of the cost of the Highland street garage and contains such charges as indirect labor, fuel oil used, building repairs, depreciation on building, electricity used, gas used, tool expense, telephone expense, and miscellaneous expenses. From each month's overhead are deducted the inside storage for the month and the distribution charge for gasoline and oil. The remaining amount is divided by the number of actual direct labor-hours and the result gives the amount of overhead per hour. An attempt is made, however, to establish a rate suitable for the year rather than have a different rate each month.

Material.— This item represents the cost of all parts used on repair jobs here at the garage, as well as accessories, exclusive of tires, tubes, and batteries.

Tires and Tubes.— This item shows the cost of tires and tubes used by each vehicle.

Batteries.— This item shows the cost of batteries used by each vehicle.

Outside Repairs.— This item represents the cost of repairs done by private concerns outside our own garage.

Gasoline.— This item represents the cost of the gasoline used, plus a distribution cost of four cents a gallon, which is a deduction from overhead.

Oil.— This item represents the cost of the oil used, plus a distribution cost of two cents a quart, which is a deduction from overhead.

Storage.— This item is divided into outside storage and inside storage. Outside storage is the amount charged for the vehicles stored at outside garages during

the winter months. Inside storage is the amount charged for vehicles stored in our own garages. It is a deduction from overhead.

Depreciation.— Depreciation is figured on a straight line basis, that is, cost divided by estimated life in months equals estimated depreciation per month. Due to the uncertain economic conditions no consideration is given to a residual value at the time the rate is established. Because of this a longer estimated life is used in the calculations. It has been determined from experience that this procedure leads to a fairly accurate depreciation cost over the life of a vehicle.

The estimated life in use at the present time is as follows: 7- to 10-ton trucks and 6-ton trucks, 16 years; 8-ton trucks, 5 years; 5-ton trucks, 3- to 5-ton trucks, 4-ton trucks, 3-ton trucks, 1½-ton trucks, snow loaders and tractors, 10 years; 2-ton trucks, 8½ years; 1-ton trucks, ½-ton trucks, and sweepers, 9 years; passenger cars, 5 years. Again, these estimated lives are longer than they would be, if consideration were given to estimated residual values at the time the depreciation rates are set. It seems to be impossible to determine with any degree of accuracy the trade-in value of vehicles, thus the present procedure.

It should be kept in mind that although depreciation is a definite and tangible operating cost, the amount charged has to be an estimated amount. The aim is to have the estimated amount as nearly correct as possible. As long as this aim is accomplished, the actual method used is unimportant.

Registration Fees.— This item represents the amount charged by the Registry of Motor Vehicles for plates and certificate.

Overhead charge for 1950 is at rate of \$5 per hour.

The following is a classification of the vehicles in the Public Works Department, Automotive Division, according to capacity, showing the AVERAGE YEARLY COST, the AVERAGE YEARLY MILEAGE, and the AVERAGE COST PER MILE.

WEIGHT (Tons).	Number of Vehicles.	Average Yearly Cost.	Average Yearly Mileage.	Average Cost Per Mile.
7-10.....	6	\$3,458 16	1,264	\$2 736
8.....	1	2,341 51	2,255	1 058
6.....	1	2,566 28	—	—
5.....	8	3,071 80	5,587	0 550
3-5.....	1	2,065 77	245	8 432
3.....	1	908 82	4,211	0 216
2.....	63	1,348 54	5,945	0 227
1½.....	112	1,327 52	4,934	0 269
1.....	8	894 27	7,472	0 120
½.....	76	1,050 01	9,770	0 108
Sweepers.....	21	2,660 28	—	—
Snow Loaders.....	3	1,445 36	—	—
Crawler Tractor...	2	1,848 22	—	—
Road Grader.....	1	1,407 66	—	—
Caterpillar Crane..	1	429 83	—	—
Rollers.....	12	136 37	—	—
Passenger Cars....	22	1,201 92	11,017	0 109

7= to 10=Ton Snowfighter Sandspreaders (6 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
P-272	1942 Walter.....	\$4,459 39	1,054	\$4 230
P-284	1943 Walter.....	3,597 92	1,240	2 902
P-289	1944 Walter.....	2,834 32	1,062	2 669
P-290	1945 Walter.....	3,178 24	1,209	2 629
P-285	1943 Walter.....	3,488 53	1,522	2 292
P-283	1942 Walter.....	3,190 57	1,498	2 130
	Group Average.....	\$3,458 16	1,264	\$2 736

4=Ton Snowfighter Sandspreaders (7 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
P-354	1947 Walter.....	\$3,971 01	1,258	\$3 156
P-361	1948 Walter.....	4,529 97	1,511	2 998
P-362	1948 Walter.....	3,958 79	1,524	2 598
P-374	1949 Walter.....	3,786 26	1,536	2 465
P-373	1949 Walter.....	4,247 33	1,861	2 282
P-363	1948 Walter.....	4,268 20	1,923	2 220
P-355	1947 Walter.....	3,045 14	1,651	1 844
	Group Average.....	\$3,972 39	1,609	\$2 469

8-Ton Truck (1 Vehicle).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
TS-21	1949 G.M.C'.....	\$2,341 51	2,255	\$1 058

6-Ton Truck (1 Vehicle).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
G-56	1947 Diamond T.....	\$2,566 28	—	—

3= to 5-Ton Truck (1 Vehicle).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
P-385	1946 Mack Sander.....	\$2,065 77	245	\$8 432

3-Ton Truck (1 Vehicle).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
B-29	1948 Ford.....	\$908 82	4,211	\$0 216

5-Ton Trucks (8 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
Se-115	1945 White Sander.....	\$1,725 59	1,704	\$1 013
S-466	1947 White Dump.....	2,898 69	4,091	0 709
Se-113	1945 White Sander.....	1,033 95	1,563	0 662
S-381	1947 White Flusher.....	3,624 23	5,860	0 619
S-465	1947 White Dempster Dump	3,916 14	7,514	0 521
S-463	1947 White Dempster Dump	5,003 49	9,887	0 506
S-464	1949 White Dump.....	3,960 79	12,740	0 311
S-398	1945 White Dempster Dump	2,411 54	1,338	0 180
	Group Average.....	\$3,071 80	5,587	\$0 550

5-Ton Trucks Classified According to Type.

TYPE.	Average Yearly Cost.	Average Yearly Mileage.	Average Cost Per Mile.
2 Sanders.....	\$1,379 77	1,634	\$0 844
1 Flusher.....	3,624 23	5,860	0 619
3 Dempster Dumpsters.....	3,777 06	6,246	0 605
2 Dumps.....	3,429 74	8,416	0 408
8 Group Average.....	\$3,071 80	5,587	\$0 550

2-Ton Trucks (63 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
Se-147	1948 Ford Netco CBC.....	\$2,230 89	3,722	\$0 599
Se-148	1948 Ford Netco CBC.....	1,923 21	3,478	0 553
S-525	1948 Ford Dump COE.....	1,063 55	1,979	0 537
S-502	1948 Ford Dump.....	1,375 42	2,754	0 475
Se-150	1948 Ford Netco CBC.....	2,011 60	4,368	0 461
W-303	1949 Ford Derrick.....	1,801 61	4,290	0 420
Se-149	1948 Ford Netco CBC.....	1,517 03	3,670	0 413
P-372	1948 Ford Dump.....	1,912 96	4,881	0 392
Se-154	1948 Ford Dump.....	1,510 19	4,219	0 358
Se-151	1948 Ford Netco CBC.....	1,889 82	5,517	0 343
S-556	1949 Ford Dump.....	1,352 66	4,085	0 331
S-488	1947 Ford Dump.....	1,475 77	4,490	0 329
S-505	1948 Ford Dump COE.....	1,582 49	4,888	0 324
P-368	1948 Ford Dump.....	1,100 12	3,584	0 307
S-489	1947 Ford Dump.....	1,032 03	3,412	0 303
P-370	1948 Ford Dump.....	1,597 28	5,581	0 286
S-503	1948 Ford Dump.....	1,488 37	5,393	0 276
P-367	1948 Ford Dump.....	1,040 22	3,772	0 276
B-26	1948 Ford IR Compressor..	1,423 05	5,235	0 272
S-501	1948 Ford Dump.....	1,614 95	6,171	0 262
S-558	1949 Ford Dump.....	1,446 15	5,560	0 260
S-509	1948 Ford Dump.....	995 71	3,849	0 259
S-526	1948 Ford Dump.....	1,876 11	7,435	0 252
S-512	1948 Ford Dump COE.....	1,055 21	4,184	0 252
P-369	1948 Ford Dump.....	1,359 27	5,405	0 251
S-554	1949 Ford Dump.....	1,306 21	5,210	0 251
B-27	1948 Ford IR Compressor..	1,086 16	4,413	0 246
P-376	1949 Ford Dump.....	1,182 30	4,836	0 244
S-555	1949 Ford Dump.....	1,089 13	4,471	0 244
S-553	1949 Ford Dump.....	1,584 13	6,548	0 242
S-557	1949 Ford Dump.....	1,093 60	4,682	0 234
P-378	1949 Ford Dump.....	1,335 92	5,711	0 233
W-261	1947 Ford Derrick.....	1,194 95	5,146	0 232
Se-152	1948 Ford Dump.....	1,119 78	4,868	0 230
P-377	1949 Ford Dump.....	1,200 54	5,325	0 225
S-496	1948 Ford Dump.....	1,232 04	5,515	0 223
Se-155	1948 Ford Dump.....	1,006 53	4,531	0 222
S-510	1948 Ford Dump.....	1,465 51	6,786	0 216
S-486	1947 Ford Dump.....	1,113 40	5,179	0 215

2-Ton Trucks. — Continued.

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
P-366	1948 Ford Dump.....	\$1,025 86	4,763	\$0 215
S-552	1949 Ford Dump.....	1,318 69	6,444	0 205
W-279	1948 Ford Gate Closing....	2,714 18	13,287	0 204
W-288	1948 Ford Dump.....	1,817 33	9,001	0 202
W-286	1948 Ford Stake.....	1,623 48	8,256	0 197
S-550	1949 Ford Dump.....	928 96	4,874	0 191
W-292	1948 Ford Derrick.....	1,493 31	7,981	0 187
S-504	1948 Ford Dump.....	969 00	5,305	0 183
S-559	1949 Ford Dump.....	1,666 38	9,156	0 182
W-287	1948 Ford Derrick.....	959 26	5,261	0 182
S-513	1948 Ford Dump COE.....	828 20	4,610	0 180
S-487	1947 Ford Dump.....	1,062 22	5,922	0 179
P-379	1949 Ford Dump.....	949 32	5,313	0 179
S-507	1948 Ford Dump.....	1,134 31	6,406	0 177
Se-153	1948 Ford Dump.....	1,006 05	5,910	0 170
S-506	1948 Ford Dump COE.....	1,463 80	8,938	0 164
B-28	1948 Ford Lumber.....	747 51	4,981	0 150
S-508	1948 Ford Dump.....	1,252 91	9,125	0 137
S-551	1949 Ford Dump.....	1,224 42	9,028	0 136
S-500	1948 Ford Dump.....	1,001 59	7,386	0 136
W-306	1949 Ford IR Compressor..	1,770 93	13,076	0 135
W-305	1949 Ford IR Compressor..	1,928 16	15,678	0 123
W-284	1948 Ford Gate Closing....	1,706 01	15,357	0 111
P-380	1949 Ford Dump.....	875 15	8,503	0 103
Group Average.....		\$1,348 54	5,945	\$0 227

2-Ton Trucks Classified According to Type.

MAKE.	Average Yearly Cost.	Average Yearly Mileage.	Average Cost Per Mile.
5 Netco CBC.....	\$1,914 51	4,151	\$0 461
5 Dump COE.....	1,198 65	4,920	0 244
4 Derricks.....	1,063 55	4,383	0 243
41 Dumps.....	1,271 67	5,644	0 225
1 Stake.....	1,623 48	8,256	0 197
4 IR Compressors.....	1,552 08	9,601	0 162
2 Gate Closing.....	2,210 10	14,322	0 154
1 Lumber.....	747 51	4,981	0 150
63 Group Average.....	\$1,348 54	5,945	\$0 227

1½-Ton Trucks (112 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
S-423	1947 Ford Dump COE.....	\$987 53	832	\$1 187
S-429	1947 Ford Dump COE.....	1,247 91	1,487	0 832
Se-160	1947 Ford Dump COE.....	1,069 48	1,619	0 660
G-57	1947 Ford Wrecker.....	2,703 99	4,495	0 602
Se-127	1947 Ford Emergency.....	2,525 14	4,294	0 588
P-305	1946 Ford Dump.....	1,743 56	3,145	0 554
S-460	1947 Ford Dump COE.....	1,258 02	2,888	0 436
S-448	1947 Ford Dump.....	2,890 53	6,675	0 433
S-469	1947 Dodge Dump.....	1,221 00	2,865	0 426
S-518	1948 Dodge Sander.....	1,137 53	2,712	0 419
P-307	1946 Ford Dump.....	2,252 49	5,492	0 410
S-455	1947 Ford Dump.....	2,203 47	5,460	0 404
S-440	1947 Dodge Dump.....	966 49	2,405	0 402
S-492	1947 Ford Dump.....	1,874 47	4,745	0 395
S-472	1947 Ford Dump COE.....	1,079 02	2,759	0 391
S-434	1947 Ford Dump COE.....	1,202 93	3,206	0 388
P-334	1947 Ford Dump.....	1,893 05	4,949	0 383
S-456	1947 Ford Dump.....	2,242 66	5,918	0 379
S-468	1947 Dodge Dump.....	1,256 33	3,319	0 379
P-356	1947 Ford Dump.....	1,264 07	3,347	0 378
Se-122	1946 Ford Emergency.....	2,363 64	6,461	0 367
S-480	1947 Ford Dump.....	991 86	3,798	0 361
S-437	1947 Ford Dump.....	2,102 01	5,829	0 360
P-329	1947 Ford Dump.....	1,755 60	4,873	0 360
P-324	1947 Ford Dump.....	1,415 54	3,951	0 358
P-314	1947 Ford Express.....	1,173 51	3,296	0 356
P-323	1947 Ford Dump.....	1,663 67	4,734	0 351
S-438	1947 Ford Dump.....	2,064 14	5,934	0 348
S-431	1947 Ford Dump COE.....	955 33	2,747	0 348
P-318	1947 Ford Dump.....	1,523 56	4,392	0 347
Se-133	1947 Ford IR Compressor..	1,371 59	4,189	0 347
S-481	1947 Ford Dump.....	1,146 20	3,314	0 346
S-474	1947 Ford Dump.....	2,263 91	6,603	0 343
S-430	1947 Dodge Dump.....	1,504 24	4,415	0 340
S-422	1947 Ford Dump COE.....	837 27	2,478	0 338
Se-123	1946 Ford Emergency.....	2,093 22	6,225	0 336
P-317	1947 Ford Dump.....	1,749 11	5,221	0 335
W-254	1947 Ford IR Compressor..	1,628 16	4,900	0 332
P-308	1946 Ford Dump.....	859 86	2,607	0 330
P-304	1946 Ford Dump.....	1,402 09	4,414	0 318
S-436	1940 Ford Tractor.....	730 42	2,304	0 317
S-477	1947 Dodge Dump.....	1,376 30	4,450	0 309
S-461	1947 Ford Dump COE.....	1,327 37	4,292	0 309
S-453	1947 Ford Dump.....	1,813 54	5,960	0 304
Se-125	1947 Ford Emergency.....	1,530 57	5,141	0 298
S-524	1948 Dodge Sander.....	1,248 91	4,203	0 297
P-349	1947 Ford Dump.....	1,446 16	4,901	0 295
S-517	1948 Dodge Sander.....	1,289 06	4,374	0 295
P-342	1947 Ford Dump.....	1,784 98	6,149	0 290
S-441	1947 Dodge Dump.....	1,460 97	5,053	0 289
S-494	1948 Dodge Sander.....	1,372 56	4,796	0 286
S-454	1947 Ford Dump.....	1,239 20	4,333	0 286
S-410	1947 Ford Wrecker.....	1,082 07	3,815	0 284
W-256	1947 Ford IR Compressor..	1,483 19	5,258	0 282
S-470	1947 Dodge Dump.....	1,414 92	5,013	0 282
S-428	1947 Ford Dump COE.....	1,143 69	4,049	0 282
S-443	1947 Dodge Dump.....	1,217 18	4,414	0 275

1½-Ton Trucks. — Continued.

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
S-519	1948 Dodge Sander.....	\$1,035 05	3,779	\$0 274
P-335	1947 Ford Dump.....	1,183 81	4,407	0 269
Se-129	1947 Ford Emergency.....	1,282 80	4,882	0 263
S-523	1948 Dodge Sander.....	1,322 72	3,649	0 262
W-255	1947 Ford IR Compressor..	1,257 48	4,867	0 258
TS-19	1947 Ford Rack.....	411 27	1,593	0 258
P-332	1947 Ford Dump.....	1,312 11	5,187	0 253
P-341	1947 Ford Dump.....	1,338 01	5,348	0 250
S-521	1948 Dodge Sander.....	1,104 97	4,460	0 248
S-476	1947 Dodge Dump.....	1,479 80	6,015	0 246
P-328	1947 Ford Dump.....	1,520 94	6,357	0 239
S-520	1948 Dodge Sander.....	1,186 21	4,982	0 238
S-427	1947 Dodge Dump.....	1,086 16	4,613	0 235
W-236	1946 Ford Dump.....	1,267 72	5,407	0 234
Se-124	1946 Ford Stake Winch....	1,383 15	5,960	0 232
W-239	1946 Ford Dump.....	1,527 32	6,785	0 225
P-326	1947 Ford Dump.....	1,035 67	4,597	0 225
W-224	1945 Ford IR Compressor..	1,031 06	4,579	0 225
P-331	1947 Ford Dump.....	1,113 12	4,986	0 223
S-442	1947 Ford Dump.....	1,440 79	6,531	0 220
P-303	1946 Ford Dump.....	1,500 97	6,925	0 217
W-241	1946 Ford Dump.....	931 37	4,318	0 216
S-478	1947 Dodge Dump.....	1,238 28	6,119	0 202
P-338	1947 Ford Dump.....	953 91	4,775	0 200
W-243	1946 Ford Dump.....	1,314 57	6,719	0 198
P-309	1946 Ford Dump.....	1,206 78	6,257	0 193
S-473	1947 Dodge Dump.....	1,154 18	6,000	0 192
P-337	1947 Ford Dump.....	921 64	4,808	0 192
P-339	1947 Ford Dump.....	1,195 64	6,330	0 189
P-333	1947 Ford Dump.....	978 63	5,236	0 187
S-485	1947 Dodge Dump.....	1,307 15	7,167	0 182
S-433	1947 Dodge Dump.....	1,159 29	6,463	0 179
Se-134	1947 Ford Dump.....	1,073 84	6,009	0 179
S-482	1947 Dodge Dump.....	1,307 15	7,359	0 178
P-325	1947 Ford Dump.....	1,268 30	7,112	0 178
S-444	1947 Ford Dump.....	1,002 39	5,640	0 178
B-31	1946 Ford Dump.....	789 12	4,457	0 177
S-439	1947 Dodge Dump.....	774 92	4,375	0 177
S-447	1947 Ford Dump COE.....	1,092 08	6,242	0 175
TS-15	1947 Ford Wrecker.....	1,075 85	6,138	0 175
S-475	1947 Ford Dump.....	1,050 02	6,025	0 174
Se-135	1947 Ford Dump.....	898 46	5,181	0 173
P-322	1947 Ford Dump.....	1,364 90	7,971	0 171
P-336	1947 Ford Dump.....	1,343 02	7,833	0 171
S-409	1946 Ford Stake.....	939 25	5,434	0 171
S-491	1948 Dodge Sander.....	981 53	5,779	0 170
S-493	1948 Dodge Sander.....	1,134 90	6,894	0 165
Se-137	1947 Ford Dump.....	797 37	4,829	0 165
S-515	1948 Dodge Sander.....	1,073 77	6,658	0 161
S-424	1947 Dodge Dump.....	1,053 40	6,547	0 161
Se-136	1947 Ford Dump.....	756 07	4,687	0 161
W-244	1946 Ford Dump.....	1,437 61	9,016	0 159
TS-11	1936 Ford Flusher.....	327 52	2,169	0 151
S-522	1948 Dodge Sander.....	893 47	5,972	0 150
S-516	1948 Dodge Sander.....	1,219 04	8,646	0 141
	Group Average.....	\$1,327 52	4,934	\$0 269

1½-Ton Trucks Classified According to Make.

MAKE.	Average Yearly Cost.	Average Yearly Mileage.	Average Cost Per Mile.
30 Dodges.....	\$1,199 25	5,117	\$0 234
52 Fords.....	1,374 44	4,867	0 282
112 Group Average.....	\$1,327 52	4,934	\$0 269

1½-Ton Trucks Classified According to Type.

TYPE.	Average Yearly Cost.	Average Yearly Mileage.	Average Cost Per Mile.
11 Dump COE.....	\$1,109 15	2,964	\$0 374
5 Emergencys.....	1,959 07	5,401	0 363
1 Express.....	1,173 51	3,296	0 356
3 Wreckers.....	1,620 64	4,816	0 337
1 Tractor.....	730 42	2,304	0 317
5 IR Compressors.....	1,354 30	4,759	0 285
69 Dumps.....	1,378 08	5,320	0 259
1 Rack.....	411 27	1,593	0 258
13 Sanders.....	1,153 82	5,146	0 224
2 Stakes.....	1,161 20	5,697	0 204
1 Flusher.....	327 52	2,169	0 151
112 Group Average.....	\$1,327 52	4,934	\$0 269

1-Ton Trucks (8 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
W-269	1948 Ford Express.....	\$940 02	4,763	\$0 197
W-276	1948 Ford Express.....	955 67	5,048	0 189
W-275	1948 Ford Express.....	910 49	7,654	0 129
W-291	1948 Ford Express.....	850 96	7,093	0 120
W-301	1949 Ford Express.....	756 34	6,447	0 117
W-274	1948 Ford Express.....	1,053 79	10,270	0 103
W-270	1948 Ford Express.....	1,024 58	10,898	0 094
W-273	1948 Ford Express.....	662 27	7 601	0 087
	Group Average.....	\$894 27	7,472	\$0 120

$\frac{1}{2}$ -Ton Pickups (76 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
W-253	1947 Ford.....	\$1,151 10	5,025	\$0 229
P-387	1946 Ford.....	1,717 43	8,437	0 204
P-386	1946 G.M.C.....	1,167 95	5,843	0 200
P-347	1947 Ford.....	1,141 75	6,560	0 174
P-319	1947 Ford.....	1,789 27	10,433	0 172
W-252	1947 Ford.....	1,235 59	7,273	0 170
S-498	1948 Ford.....	1,976 44	13,075	0 151
Se-128	1947 Ford.....	1,896 61	12,524	0 151
W-262	1948 Ford.....	1,092 00	7,390	0 148
S-450	1947 Ford.....	2,018 52	13,814	0 146
S-419	1947 Ford.....	1,130 95	7,767	0 146
S-471	1947 Ford.....	1,573 62	11,069	0 142
S-411	1947 Ford.....	1,263 01	8,978	0 141
S-432	1947 Ford.....	1,791 06	12,915	0 139
S-459	1947 Ford.....	1,131 75	8,136	0 139
S-413	1947 Ford.....	1,038 96	7,578	0 137
Se-131	1947 Ford.....	743 82	5,524	0 135
P-346	1947 Ford.....	1,666 65	12,550	0 134
P-330	1947 Ford.....	1,304 83	9,850	0 132
P-320	1947 Ford.....	1,190 14	9,077	0 131
S-499	1948 Ford.....	1,083 04	8,333	0 130
P-315	1947 Ford.....	1,437 52	11,110	0 129
P-321	1947 Ford.....	1,117 00	8,658	0 129
S-414	1947 Ford.....	1,219 35	9,779	0 125
W-272	1948 Ford.....	666 81	5,812	0 124
Se-126	1947 Ford.....	1,190 91	9,687	0 123
TS-16	1947 Ford.....	1,178 92	9,600	0 123
Se-138	1947 Ford.....	1,156 38	9,492	0 122
Se-116	1946 G.M.C.....	693 54	5,680	0 122
P-343	1947 Ford.....	998 71	8,333	0 120
W-298	1949 Ford.....	900 05	7,569	0 119
S-425	1947 Ford.....	1,095 66	9,328	0 118
S-538	1949 Ford.....	1,174 28	10,051	0 117
W-297	1949 Ford.....	726 01	6,180	0 117
P-340	1947 Ford.....	1,008 42	8,690	0 116
S-412	1947 Ford.....	1,596 40	13,999	0 114
P-302	1946 Ford.....	790 39	7,023	0 113
S-497	1948 Ford.....	1,097 20	9,875	0 111
S-416	1947 Ford.....	965 44	8,893	0 109
S-417	1947 Ford.....	1,209 77	11,530	0 105
S-435	1947 Ford.....	931 40	7,041	0 104
Se-118	1946 G.M.C.....	910 78	8,950	0 102
S-535	1949 Ford.....	987 41	9,788	0 101
Se-139	1947 Ford.....	853 54	8,425	0 101
S-418	1947 Ford.....	886 01	8,820	0 100
P-348	1947 Ford.....	835 45	8,459	0 099
P-344	1947 Ford.....	1,021 18	10,415	0 098
P-345	1947 Ford.....	629 57	6,533	0 096
TS-20	1948 Willys.....	393 13	4,106	0 096
Se-132	1947 Ford.....	881 95	9,408	0 094
TS-17	1947 Willys.....	434 54	4,625	0 094
S-458	1947 Ford.....	1,129 72	12,116	0 093
W-271	1948 Ford.....	1,127 15	12,189	0 092
W-296	1949 Ford.....	943 40	10,222	0 092
S-495	1948 Ford.....	1,130 94	12,392	0 091
S-542	1949 Ford.....	1,008 68	11,026	0 091

½-Ton Pickups. — Continued.

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
W-294	1949 Ford.....	\$696 39	7,729	\$0 090
S-452	1947 Ford.....	636 21	7,130	0 089
Se-141	1947 Ford.....	901 91	10,092	0 088
S-457	1947 Ford.....	838 06	9,492	0 088
S-451	1947 Ford.....	1,098 90	13,557	0 081
W-268	1948 Ford.....	976 81	12,079	0 081
W-295	1949 Ford.....	645 79	8,077	0 080
S-426	1947 Ford.....	1,094 65	13,961	0 078
W-265	1948 Ford.....	727 51	9,438	0 077
S-536	1949 Ford.....	785 13	10,449	0 075
S-514	1948 Ford.....	752 27	10,090	0 075
W-266	1948 Ford.....	514 79	6,868	0 075
S-562	1949 Ford.....	799 52	11,109	0 072
Se-140	1947 Ford.....	941 19	13,375	0 070
S-543	1949 Ford.....	930 84	13,727	0 068
W-263	1948 Ford.....	883 28	12,948	0 068
W-300	1949 Ford.....	654 92	10,235	0 064
S-541	1949 Ford.....	978 10	15,420	0 063
S-479	1947 Ford.....	811 97	12,850	0 063
W-299	1949 Ford.....	730 83	10,685	0 061
	Group Average.....	\$1,050 01	9,770	\$0 108

½-Ton Pickups Classified According to Make.

MAKE.	Average Yearly Cost.	Average Yearly Mileage.	Average Cost Per Mile.
3 G.M.C.'s.....	\$ 924 09	6,824	\$0 135
71 Fords.....	1,073 26	9,832	0 109
2 Willys.....	413 84	4,366	0 095
76 Group Average.....	\$1,050 01	9,770	\$0 108

Snow Loaders (3 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.
P-357	1948 Barber Greene.....	\$1,620 51
P-358	1947 Barber Greene.....	1,411 01
P-359	1948 Barber Greene.....	1,304 57
	Group Average.....	\$1,445 36

Grader (1 Vehicle).

Department No.	YEAR AND MAKE.	Yearly Cost.
P-350	1947 Huber Road.....	\$1,407 66

Sweepers (21 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.
S-534	1942 Elgin.....	\$5,120 42
S-532	1949 Elgin.....	4,779 37
S-548	1949 Elgin.....	4,539 88
S-545	1949 Elgin.....	3,615 52
S-385	1944 Elgin.....	3,487 77
S-527	1948 Austin Western.....	3,449 40
S-546	1949 Elgin.....	3,102 99
S-530	1948 Austin Western.....	2,694 58
S-531	1948 Austin Western.....	2,675 92
S-547	1949 Elgin.....	2,594 31
S-528	1948 Austin Western.....	2,421 54
S-544	1949 Elgin.....	2,411 53
S-382	1942 Elgin.....	2,367 47
S-387	1945 Elgin.....	2,319 45
S-549	1949 Elgin.....	2,261 85
TS-25	1950 Elgin.....	2,194 01
S-383	1942 Elgin.....	1,480 27
S-368	1941 Elgin.....	1,395 55
S-388	1945 Elgin.....	1,294 70
TS-18	1947 Austin Western.....	983 84
S-533	1942 Elgin.....	720 91
	Group Average.....	\$2,660 28

Crane (1 Vehicle).

Department No.	YEAR AND MAKE.	Yearly Cost.
W-191	1939 22-Ton Portable on Caterpillar.....	\$429 83

Buffalo Springfield Rollers (12 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.
R-29	1930 6-ton Road.....	\$343 18
R-30	1931 6-ton Road.....	584 13
R-32	1939 2-ton Sidewalk.....	104 25
R-33	1939 2-ton Sidewalk.....	49 77
R-34	1939 2-ton Sidewalk.....	92 22
R-35	1940 2-ton Sidewalk.....	62 22
R-36	1940 2-ton Sidewalk.....	145 39
R-37	1941 2-ton Sidewalk.....	2 00
R-38	1941 2-ton Sidewalk.....	26 22
R-39	1949 2-ton Tandem (with towing attachment)...	133 92
R-40	1949 2-ton Tandem (with towing attachment)...	82 34
R-41	1949 2-ton Tandem (with towing attachment)...	10 81
	Group Average.....	\$136 37

Tractors (2 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.
P-365	1948 Allis Chalmers Crawler.....	\$2,237 67
P-364	1948 Allis Chalmers Crawler.....	1,458 77
	Group Average.....	\$1,848 22

Unclassified Vehicles.

Department No.	YEAR AND MAKE.	Yearly Cost.
S-244	1933 Highway Semi-Trailer.....	\$2 00
S-245.	1933 Highway Semi-Trailer.....	2 00
S-529	1948 Snow Shanty Trailer.....	0 00
S-560	1948 Hobart Arc Welder Trailer.....	58 78
S-490	1947 Stewart Warner Portable Heater.....	72
P-360	1947 Stewart Warner Portable Heater.....	0 00
P-243	1939 Hauck Asphalt Pot Heater Trailer.....	2 58
P-286	1943 Hauck Asphalt Pot Heater Trailer.....	0 00
P-287	1943 Hauck Asphalt Pot Heater Trailer.....	0 00
S-483	1947 Huski Unisickle Lawnmower.....	1 52
S-484	1947 Huski Unisickle Lawnmower.....	0 00
P-269	1936 Standard Lawnmower.....	0 00
P-298	1946 Whirlwind Lawnmower.....	31 63
P-301	1946 Whirlwind Lawnmower.....	6 66
P-242	1939 Smith Concrete Mixer Trailer.....	33 98
P-288	1944 Syntron Gasoline Paving Breaker.....	0 00
P-299	1946 American Brake Shoe Paint Spray Machine	0 00
P-247	1940 Homelite Generator.....	0 00
P-255	1940 Homelite Generator.....	42
P-256	1940 Homelite Generator.....	0 00
P-310	1946 Griffin Highlight Trailer.....	75 09
P-311	1946 Griffin Highlight Trailer.....	83 51
P-312	1946 Griffin Highlight Trailer.....	5 40
P-244	1939 Homemade 2-ton Trailer.....	2 00
G-27	1929 Hvass 5-ton Trailer.....	0 00
P-371	1948 Acker Core Drill.....	220 49
W-184	1937 Littleford Handee Box Toolhouse Trailer..	2 00
W-259	1947 $\frac{1}{2}$ -ton Willys Toolbox Trailer.....	7 81
W-260	1947 $\frac{1}{2}$ -ton Willys Toolbox Trailer.....	2 60
W-277	1947 1-ton Nash Kelvinator Toolbox Trailer....	2 00
W-278	1947 1-ton Nash Kelvinator Toolbox Trailer....	34 63
W-285	1948 1-ton Homemade 2-Wheel Toolbox Trailer..	29 32
W-220	1943 Wesson Tiernan Chlorinator Trailer.....	2 10
Se-156	1947 Flexible Power Bucket Machine 2-Wheel Trailer.....	16 70
Se-157	1947 Flexible Power Bucket Machine 2-Wheel Trailer.....	34 84
P-316	1946 Portable Air Compressor.....	0 00
B-17	1935 Auxiliary Air Compressor.....	124 25
W-222	1945 IR Compressor Trailer.....	2 60

Passenger Cars (22 Vehicles).

Department No.	YEAR AND MAKE.	Yearly Cost.	Yearly Mileage.	Cost Per Mile.
P-352	1947 Willys Jeep.....	\$1,252 45	4,903	\$0 255
W-289	1948 Ford Sedan.....	974 31	4,468	0 218
P-353	1947 Willys Jeep.....	1,215 46	5,893	0 206
S-539	1949 Ford Sedan.....	717 22	4,231	0 170
Se-142	1947 Willys Jeep.....	2,665 16	16,315	0 163
C-10	1947 Buick Sedan.....	2,599 70	17,389	0 150
Se-143	1947 Willys Jeep.....	1,062 96	8,112	0 131
W-230	1946 Buick Sedan.....	1,423 70	12,110	0 118
P-351	1947 Willys Jeep.....	856 93	7,665	0 112
S-561	1949 Buick Sedan.....	1,396 45	12,575	0 111
Se-158	1950 Buick Sedan.....	1,249 67	11,718	0 107
TS-24	1949 Ford Sedan.....	629 27	6,362	0 099
W-293	1949 Buick Sedan.....	1,162 55	11,887	0 098
TS-22	1949 Buick Sedan.....	1,428 39	16,016	0 089
P-375	1949 Buick Sedan.....	1,634 75	18,460	0 088
W-302	1949 Ford Sedan.....	800 82	9,180	0 087
Se-144	1947 Willys Jeep.....	1,425 68	16,783	0 085
P-381	1950 Ford Sedan.....	773 24	9,621	0 080
S-563	1950 Ford Sedan.....	858 29	12,390	0 069
P-382	1950 Ford Sedan.....	1,078 22	16,670	0 064
TS-23	1949 Ford Sedan.....	513 88	8,062	0 064
W-304	1949 Ford Sedan.....	723 29	11,572	0 063
	Group Average.....	\$1,201 92	11,017	\$0 109

Passenger Cars Classified According to Make.

MAKE.	Average Yearly Cost.	Average Yearly Mileage.	Average Cost Per Mile.
6 Willys Jeeps.....	\$1,413 11	9,945	\$0 142
7 Buick Sedans.....	1,556 37	14,308	0 109
9 Ford Sedans.....	785 39	9,173	0 086
22 Group Average.....	\$1,201 92	11,017	\$0 109

Passenger Cars Classified According to Type.

MAKE.	Average Yearly Cost.	Average Yearly Mileage.	Average Cost Per Mile.
6 Jeeps.....	\$1,413 11	9,945	\$0 142
16 Sedans.....	1,122 73	11,419	0 098
22 Group Average.....	\$1,201 92	11,017	\$0 109

APPENDIX B.

REPORT OF THE DIVISION ENGINEER OF
THE BRIDGE AND HIGHWAY DIVISION.

BOSTON, January 2, 1951.

To the Commissioner of Public Works.

Dear Sir:

I submit the following report of the income, expenditures, and operation of the Bridge and Highway Division for the year ending December 31, 1950, in two sections. The Bridge Section report covers the Bridge, Ferry, and Tunnel Services, which comprised the former Bridge and Ferry Division. The Highway Section report covers the Paving and Street Lighting Services, which comprised the former Highway Division. On May 15, 1950, these two divisions were combined to form the present Bridge and Highway Division.

Respectfully submitted,

JOHN DEMEULENAER,
Division Engineer.

I—BRIDGE SECTION

SUMMARY OF BUDGET APPROPRIATIONS.

Bridge Service, Regular.

Regular appropriations, 1950	\$784,134 97
Transfer from	43,245 13

	<u>\$740,889 84</u>
Expenditures, 1950	716,270 39

Unexpended balance, December 31, 1950 .	<u>\$24,619 45</u>
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Bridges, Repairs, etc.

Balance from 1949	\$99,215 95
1950 appropriation	350,000 00

	<u>\$449,215 95</u>
Expenditures, 1950	241,934 20

Unexpended balance, December 31, 1950 .	<u>\$207,281 75</u>
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Bridges, Construction of.

Balance from 1949	\$2,348,153 42
Expenditures, 1950	32,727 42

Unexpended balance, December 31, 1950 . \$2,315,426 00

Ferry Service.

Regular appropriation, 1950	\$380,046 47
Expenditures, 1950	342,872 45

Unexpended balance, December 31, 1950 . \$37,174 02

Ferry Improvements, Etc.

Balance from 1949	\$523 75
Transfers from	523 75

Unexpended balance, December 31, 1950 . \$0 00

Sumner Tunnel.

Regular appropriation, 1950	\$476,329 90
Expenditures, 1950	461,404 93

Unexpended balance, December 31, 1950 . \$14,924 97

The foregoing does not include certain expenditures for construction work for other divisions, which work was supervised by the engineers of this division.

In an order from the Department of Public Utilities, Commonwealth of Massachusetts, schedules of tolls and charges for the use of the Sumner Tunnel, between Boston Proper and East Boston, were approved, covering the year 1950.

The City operates one ferry, the so-called "South Ferry," with the Boston terminus at Eastern avenue and the East Boston terminus at Lewis street.

The more important works undertaken during the past year in the Bridge and Highway Division, Bridge Section, were redecking and guniting Belgrade Avenue Bridge; rebuilding Blakemore Street Bridge; redecking Boylston Street Bridge; redecking sections of spans 1 and 2 of the Charlestown Bridge; making minor steel repairs to the Charlestown Bridge; making repairs by welding on draw span of the Charlestown Bridge; making repairs to operating machinery of the Chelsea Street Bridge; redecking the drawspan of the Dover Street Bridge; repairing the Fairmount Avenue Bridge;

removing the drawspan of the Meridian Street Bridge; resurfacing the approaches of Warren Bridge; making repairs to the roadway and pile bents of Warren Bridge (three contracts); repairing the sidewalk of West Newton Street Bridge; repairing the pavement of the Sumner Tunnel; cleaning the surface drainage system of the Sumner Tunnel; installing new steam boiler, etc., in the London street garage of the Sumner Tunnel; cleaning exhaust duct and exhaust fan rooms at the Sumner Tunnel; making miscellaneous repairs to Ferryboat "Daniel A. MacCormack"; making general repairs, cleaning and painting the hull of ferryboat "Charles C. Donoghue"; dredging the receiving station at Albany street for the Sanitary Division; and removing snow and ice in conjunction with other divisions.

BRIDGE SERVICE.

Redecking and Guniting the Belgrade Avenue Bridge, over the New York, New Haven & Hartford Railroad.

Because of disintegration of the concrete protecting the steelwork of the floor system and fascias, a contract was entered into with Martin J. Kelly Company, Inc., for making the necessary repairs by guniting. The work also included resurfacing and waterproofing the deck to eliminate the seepage causing the conditions mentioned above.

After the work had started, the defective condition of the protective concrete on the underside was found to be so extensive that it was decided to remove the defective surface concrete instead of refinishing by guniting.

Work commenced on May 20, 1950, and was completed on December 4, 1950, at a cost of \$10,375.

General Repairs to the Bennington Street Bridge, over the Former Boston, Rerere Beach & Lynn Railroad.

Under a contract with Martin J. Kelly Company, Inc., this work was commenced on October 3, 1949, and was carried on until December 7, 1949. Because of delays in delivery of materials, work was suspended until March 8, 1950. The work was completed May 2, 1950, at a total cost of \$19,865.48.

*Rebuilding Blakemore Street Bridge, over the New York,
New Haven & Hartford Railroad.*

The original structure, consisting of steel pony trusses and floor beams and wooden deck, having deteriorated beyond reasonable repair, and being incapable of safely carrying present-day traffic, a contract was entered into with A. Orlando, Inc., for replacing the old superstructure with a new one consisting of steel plate girders, steel floor beams, concrete deck, and bituminous concrete wearing surface.

Work commenced on November 30, 1950, and is expected to be completed in midyear of 1951. No payments have been made on this contract to date. The estimated cost of completion is \$54,000.

*Redecking the Boylston Street Bridge, over the Boston &
Albany Railroad.*

A contract was entered into with John F. Shea Company, Inc., for cleaning and painting the steelwork and renewing the surface plank, wearing surface, and necessary sidewalk planking and stringers throughout the bridge. Work commenced September 11, 1950, and due to delay in shipments of lumber was postponed until the spring of 1951. Payments of \$7,072 have been made to date on an estimated cost of \$36,827.

Emergency Repairs to the Charlestown Bridge Piers.

Work in connection with the strengthening of the piers of Charlestown Bridge was commenced August 17, 1949, under a contract with Crandall Engineering Company and was continued during the winter. Work was completed April 29, 1950, at a cost of \$127,384.17.

*Minor Steel Repairs to the Charlestown Bridge, over the
Charles River.*

Due to badly corroded steel members supporting the downstream sidewalk on Span 1, it was found necessary to remove the sidewalk, make necessary steel repairs, and replace the sidewalk. Under a contract entered into with Frederick W. Byron this work was commenced June 19, 1950, and was completed July 11, 1950, at a cost of \$5,358.20.

Repairs by Welding on the Drawspan of the Charlestown Bridge.

A contract was entered into with Industrial Welding Company for securing sections of the steel deck and supporting steel by welding. Work commenced October 7, 1950, and was completed October 21, 1950, at a cost of \$1,578.30.

Redecking Sections of Spans 1 and 2, Charlestown Bridge, over the Charles River.

Because of dangerous conditions which developed in the downstream roadway of Spans 1 and 2, due to defective underplank, a contract was entered into with D. A. Rossano Company, Inc., for the necessary repairs. Work commenced December 8, 1950, and is expected to be completed in January, 1951. No payments have been made to date.

Emergency Repairs to Operating Machinery of the Chelsea Street Bridge, over the Chelsea River.

Due to the breaking of an end section of the rack on the upstream operating strut, it was necessary to enter into an emergency contract with General Ship and Engine Works, Inc., for making the necessary repairs. Work commenced August 26, 1950, and was completed August 30, 1950, at a cost of \$2,511.52.

Redecking the Drawspan of the Dover Street Bridge.

The spruce wearing surface, the underplank, and a large percentage of the stringers were found to be in very poor condition. A contract for making the necessary repairs was entered into with Martin J. Kelly Company, Inc. Work was commenced March 29, 1950, and was completed August 25, 1950, at a cost of \$24,342.16.

Repairs to the Fairmount Avenue Bridge, over the New York, New Haven & Hartford Railroad.

Due to the poor condition of the wearing surface and underplank of this bridge, a contract was entered into with John F. Shea Company, Inc., for removing the asphalt plank wearing surface, renewing defective underplank, and laying a new bituminous concrete wearing surface. The work included removing the

stairway located on the inbound railroad side of the bridge. Work commenced on July 24, 1950, and was completed November 21, 1950, at a cost of \$10,780.24.

Removing the Drawspan, Approach Sections, etc., of the Meridian Street Bridge.

In connection with providing a 175-foot waterway at the site of the Meridian Street Bridge, as ordered by the U. S. Army Engineers, and as the first step toward the rebuilding of this bridge, a contract was entered into with M. & R. Construction Company for removing the entire drawspan and foundation, the entire Chelsea approach, and approximately 142 feet of the East Boston approach. The work was commenced on June 12, 1950, and is still in progress. Payments for this work to date total \$35,187.02. The estimated cost of completion is \$43,200.

Repairs to Roadway and Pile Bents of Warren Bridge.

The roadway plank and paving and the pile bents were repaired and strengthened under three contracts with A. Orlando, Inc.

Work on the first contract commenced April 20, 1950, and was completed August 11, 1950, at a cost of \$30,219.18.

Work on the second contract commenced September 12, 1950, and was completed November 11, 1950, at a cost of \$22,652.46.

Work on the third contract was commenced November 1, 1950, and was completed November 20, 1950, at a cost of \$8,972.96.

Resurfacing the Warren Bridge Approaches.

Upon completion of the necessary roadway repairs, a contract was entered into with Warren Brothers Company for placing bituminous concrete wearing surface on both approach roadways. Work commenced October 24, 1950, and was completed November 29, 1950, at a cost of \$11,431.13.

Repairing Sidewalk on West Newton Street Bridge.

A contract was entered into with Atlantic Steel Company for renewing the southwesterly sidewalk. Work was commenced October 4, 1950, and was completed November 5, 1950, at a cost of \$2,094.04.

Yard Forces.

The yard forces made repairs on 30 bridges, the work varying in extent from minor repairs to such operations as renewing or rebuilding entire wooden roadway decks, sidewalks, aprons, etc. Included in such work was the rebuilding of the drawspan roadway on the Broadway Bridge, over Fort Point Channel.

Typical work included patch planking on roadways, sidewalks, pier platforms, stairways, etc.; repairing, cleaning, and painting drawhouses, controller houses, machinery housings, fences, roadway gates, etc.; regulating bascule bridge counterweights as required; repairing floats, sand boxes, and coal bins.

The maintenance force also cleaned sidewalks and stairways of the intown area during the year, removing snow, refuse, etc.

Ordinary electrical and machinery maintenance work was done by the electrician and machinists.

FERRY SERVICE.

The following ferryboats are in commission:

NAME.	When Built.	Length.	Gross Tons.
Charles C. Donoghue.....	1926	174 feet, 4 inches	756.77
Daniel A. MacCormack.....	1926	174 feet, 4 inches	756.77
Ralph J. Palumbo *.....	1930	174 feet, 4 inches	779

* The City Council passed an order on April 3, 1950, approved by the Mayor April 4, 1950, authorizing the sale at public auction of this boat, which was no longer needed to maintain efficient ferry service. The boat was sold for \$22,500 and it is estimated that the City will save approximately \$26,000 annually in decreased maintenance costs, etc.

These boats are of the propeller type and are steel boats.

The work of this service for the year consisted of the following:

Miscellaneous Repairs to Ferryboat

"Daniel A. MacCormack."

A contract was entered into with General Ship and Engine Works Company, Inc., for routine repairs. Work commenced May 31, 1950, and was completed June 30, 1950, at a cost of \$3,866.42.

*Cleaning and Painting Hull of Ferryboat**"Charles C. Donoghue."*

A contract was entered into with James B. Munro for the annual cleaning, painting, and repairing of the hull. Work was commenced July 28, 1950 and was completed August 17, 1950, at a cost of \$9,343.50.

General Repairs to Ferryboat "Charles C. Donoghue."

A contract was entered into with General Ship and Engine Works Company, Inc., for making annual general repairs to this boat. Work commenced August 21, 1950, and was completed November 16, 1950, at a cost of \$53,011.01.

Removing Ashes, etc., from the Ferryboats.

A contract was awarded to Edward F. Butler on December 30, 1949, for removal of ashes from the ferryboats. Work commenced January 1, 1950, and was completed December 31, 1950, at a cost of \$2,453.64.

Department Force.

During the year machinists, carpenters, painters, riggers, and other mechanics, who are included in the personnel of the Ferry Service, made such repairs to the plant as the extent of materials and equipment at their disposal would permit. This work consisted mainly of minor repairs to the machinery on the boats, repairs to ferry bridge machinery, ferry bridge roadways, and head house repairs in general.

SUMNER TUNNEL SERVICE.

Renewing Traffic Signal Control Cables at the Sumner Tunnel.

A contract for doing this work was awarded to Kenworthy & Taylor, Inc., on December 23, 1949. Work commenced January 4, 1950, and was completed February 24, 1950, at a cost of \$6,783.

Repairing the Pavement of the Sumner Tunnel.

A contract was entered into with Rufo Construction Company for making necessary repairs to the granite block pavement. Work commenced May 1, 1950, and was completed June 17, 1950, at a cost of \$7,212.50.

Cleaning the Surface Drainage System of the Sumner Tunnel.

A contract was entered into with James A. Freaney, Inc., for a periodic maintenance cleaning of the drainage system. Work was commenced September 12, 1950, and was completed October 4, 1950, at a cost of \$2,538.

Cleaning Exhaust Duct and Exhaust Fan Rooms at the Sumner Tunnel.

A contract was entered into with Chemical Fire and Rust Proofing Company for a periodic maintenance cleaning of the exhaust system. Work was commenced November 13, 1950, at a cost of \$1,755.

Installing New Steam Boiler with Oil Burner in the London Street Garage of the Sumner Tunnel.

A contract was entered into with Atlantic Steel Company to install a new unit to replace the original boiler and burner which had become badly worn and inefficient in operation. Work was commenced November 6, 1950, and was completed December 20, 1950, at a cost of \$2,222.22.

SUMMARY OF OPERATIONS DURING 1950.

1. *Vehicular Traffic.*

	1946	1947	1948	1949	1950
Total.....	8,432,721	8,748,162	8,784,545	9,162,266	9,283,700
Monthly Average....	702,727	729,014	729,545	763,522	773,641
Weekly Average.....	162,168	168,234	168,356	176,197	178,045
Daily Average.....	23,103	23,968	23,920	25,171	25,435

2. *Power.*

	1946	1947	1948	1949	1950
Total Kilowatts.....	5,809,371	5,133,526	5,179,596	4,403,936	4,331,103
Number of Vehicles...	7,223,762	8,748,162	9,784,545	9,162,266	9,283,700

3. *Garage Service.*

	1946	1947	1948	1949	1950
Tow Jobs.....	327	321	358	242	285

4. *Booth Red Signal.*

	1946	1947	1948	1949	1950
Booth Red On.....	5	4	21	16	11
Total Duration (Minutes).....	57	51	146	83	150

5. *Fires.*

There was one slight fire in a passenger car — minor damage.

6. *Motors, Fans, and Compressors.*

All of the 28 fan motors are in good working condition and are operating efficiently.

The oil and grease in all fans have been changed at regular intervals, as per schedule.

The 28 fan controllers are in good operating condition; adjustments and repairs were made as required.

7. *Transformers, Circuit Breakers, and Relays.*

All transformers (20) have been tested by the Boston Edison Company for oil acidity and new oil has been added as required.

All circuit breakers have been tested and reset as required for the correct voltage operation.

All relays have been inspected, tested, and reset to increase safety in operation of equipment.

8. *Carbon Monoxide Equipment.*

All four carbon monoxide analyzers are operating, adjustments have been made and chemicals added, as per schedule.

The four Micro-Max recorders used in connection with the analyzers are recording properly.

9. *Toll Equipment.*

All twelve (12) toll registers are operating correctly, all toll registers are under constant supervision, all relays and counters are adjusted and replaced as required.

Routine insulation tests of all cables and wiring have been made. Pressure tests of treadles indicate all are in good working condition. All defective and faulty treadles have been repaired or replaced as required.

10. *Pumps.*

Various changes were made to foot valves and piping to improve the operation of the pumps. Similar changes and adjustments were made to float switches, valves, etc., in portal pump rooms. Repairs to motors and controls were made as required.

11. *Storage Batteries.*

The storage batteries are under strict supervision and maintenance and are in first-class condition. Each ventilating building has a set of 60 storage batteries.

12. *Traffic Signals.*

Defective relays and controls are replaced as needed. All broken glass and lenses are replaced as needed. Defective contacts were renewed and replaced.

13. *Motor Generators.*

The four motor generators are under a regular maintenance schedule whereby all repairs to brushes, controls, and commutators are repaired and adjusted as may be needed. All motor generators are operating efficiently.

14. *Telephone System.*

Repairs and replacements to defective hand sets, relays, cords and jacks were made as required.

15. *Tunnel, General.*

On March 25, 1950, the Boston Traffic Commission moved from the third floor of the Tunnel Administration Building to their new building on Southampton street, Boston. This area is now being used by the Sumner Tunnel as a locker room and an office for the Bridge Service field engineers.

The towing charges for the removal of vehicles from the Tunnel were abolished as of December 31, 1950.

On September 20, 1950, new machines were purchased and are used by the tollman, whereby a statement of his daily accounts is recorded and sent in with the receipts to the cashier's office, a carbon copy being retained in the machine, which is later sent to the Auditor's office at City Hall.

On September 1, 1950, the City Treasurer publicly notified the holders of 4 per cent Traffic Tunnel Bonds, City of Boston (\$4,000,000), that these bonds were being called in for retirement and cancellation.

WORK FOR OTHER DIVISIONS.

SANITARY DIVISION.

Dredging at the Albany Street Receiving Station, Albany Street, Boston.

This division made preliminary surveys and prepared specifications for dredging the slips at the Albany street station. A contract was entered into with Bay State Dredging Company for this work. Work commenced August 30, 1950, and was completed September 1, 1950, at a cost of \$3,927.80.

BRIDGE SERVICE.

FINANCIAL STATEMENT FOR 1950.

Expenditures from Maintenance Appropriation.

Boston Bridges	\$716,270 39
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Total Expenditures.

From Maintenance Appropriation	\$716,270 39
From Special Appropriations	274,661 62
	<u>\$990,932 01</u>

*Expenditures on Boston Bridges.**Administration.*

Salaries:

Division engineer	\$3,549 53	
Engineers, inspectors, clerks	69,653 68	
Supervisor, deputy supervisor	7,581 59	
		\$80,784 80

Office.

Printing, postage, stationery	\$1,609 35	
Traveling expenses	212 47	
Office supplies	394 01	
Engineers' instruments, new and repaired	57 95	
Typewriter and adding machine service	63 78	
Blue print room	65 54	
Binding	14 75	
Miscellaneous	344 24	
		2,762 09
		<u>\$83,546 89</u>

*Yard and Stockroom.**Yard.*

Clerks, yardman, and watchmen	\$17,784 09	
Holiday, sick leave, and vacations	6,788 97	
Traveling expenses	291 83	
Tools, new and repaired	2,506 70	
Telephone	452 73	
Repairs in yard	1,439 41	
New intercommunication system	138 25	
Fuel	689 86	
Light	330 94	
Supplies and miscellaneous	1,006 74	
Auto equipment	8,276 90	
		\$39,706 42

Stockroom.

Stock purchased	\$23,597 93
Stock used	18,707 84

Increase in stock	4,890 09
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<u>\$44,596 51</u>

Tidewater Bridges, 1950.

BRIDGES.	Drawtenders' Salaries.	Mechanics' Wages.	Material.	Repair Bills.	Supplies.	Total.
Broadway.....	\$31,147 77	\$11,577 82	\$2,786 24	\$747 94	\$710 13	\$46,969 90
Charlestown.....	52,957 80	5,741 24	2,068 27	1,719 69	1,011 14	63,498 14
Chelsea North *.....	6,620 36	1,088 46	49 86	231 77	198 30	8,188 75
Chelsea South.....	32,809 82	1,380 98	266 44	654 29	816 83	35,928 36
Chelsea Street.....	39,797 92	3,519 19	482 31	1,773 42	1,010 95	46,583 89
Congress Street.....	36,624 44	1,900 54	594 67	77 53	702 71	39,899 89
Dover Street.....	32,073 83	3,611 66	1,224 80	1,079 78	594 51	38,584 58
L Street †.....	40,005 05	3,318 30	737 24	966 52	785 30	45,812 41
Malden.....	44,034 14	1,566 74	173 34	479 68	858 49	47,112 39
Meridian Street ‡.....	23,586 48	1,367 96	137 06	345 87	420 38	25,857 73
Northern Avenue.....	41,246 15	7,835 86	2,772 37	4,431 88	2,978 05	59,264 31
Summer Street.....	38,366 61	5,203 11	583 80	2,815 38	473 35	47,442 25
Warren.....	36,001 44	8,716 46	8,210 41	1,959 13	798 80	55,686 24
Totals.....	\$455,271 82	\$56,828 32	\$20,086 81	\$17,282 88	\$11,358 90	\$560,828 77

* Bridge closed permanently March 6, 1950.

† Now Summer Street, over Reserved Channel.

‡ Bridge closed for rebuilding June 12, 1950.

Repairs on Inland Bridges, 1950.

BRIDGES.	Labor and Material.
Babson Street.....	\$199 00
Belgrade Avenue.....	655 49
Bennington Street.....	297 15
Boylston Street.....	1,270 61
Blakemore Street.....	1,467 56
Broadway Extension.....	759 34
Byron Street.....	113 60
Camden Street — Gainsborough Street (foot).....	178 07
Clarendon Street, over New York, New Haven & Hartford Railroad.....	274 27
Dana Avenue.....	234 55
Dartmouth Street (rent).....	300 00
Dorchester Avenue at Kempton Street.....	150 49
Durham Street — West Walnut Park (foot).....	436 24
Everett Street, Allston.....	1,735 94
Carried forward.....	\$8,072 31

Repairs on Inland Bridges. — Concluded.

BRIDGES.	Labor and Material.
<i>Brought forward</i>	\$8,072 31
Everett Street, East Boston.....	2,218 00
Fairmount Avenue.....	195 85
Harvard Street.....	67 95
Irrington Street — Yarmouth Street (foot).....	146 85
Jones Avenue (foot).....	803 71
Massachusetts Avenue, over New York, New Haven & Hartford Railroad	821 25
Milton Lower Mills.....	206 55
Norfolk Street.....	105 95
Perkins Street (foot).....	243 90
Public Landing, Northern Avenue.....	100 00
Redfield Street.....	334 45
Sprague Street.....	358 40
Southampton Street.....	192 25
Summer Street, over A Street.....	463 02
Toll Gate Way.....	886 59
West Fourth Street.....	952 90
West Newton Street.....	95 37
Winthrop.....	59 54
Cleaning bridges.....	5,604 00
Snow and sanding.....	1,625 73
Other services.....	3,743 65
Total.....	\$27,298 22

SUMMARY.

Administration	\$83,546 89
Yard and stock room	44,596 51
Tidewater bridges	560,828 77
Inland bridges	27,298 22
Total	<u>\$716,270 39</u>

SPECIAL APPROPRIATIONS.

BRIDGES, REPAIRS, ETC.

Allston Bridge:

Eastern Contracting Company	\$17,243 21
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Bennington Street Bridge, over Boston, Revere

Beach & Lynn Railroad:

Martin J. Kelly Company, Inc.	10,624 39
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Belgrade Avenue Bridge:

Martin J. Kelly Company, Inc.	8,818 75
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Boylston Street Bridge:

Eastern Contracting Company	\$263 21	
John F. Shea Company, Inc.	7,072 00	
Analysis of paint	30 00	
Advertising	28 53	
		7,393 71

Broadway Bridge:

Material — lumber and nails	8,887 33
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Charlestown Bridge:

Crandall Engineering Company	\$73,140 26	
Frederick W. Byron	5,358 20	
Industrial Welding Company	1,578 30	
Advertising	80 00	
		80,156 76

Chelsea Street Bridge:

General Ship and Engine Works, Inc.	\$2,511 52	
Advertising	23 50	
		2,535 02

Dover Street Bridge:

Martin J. Kelly Company, Inc.	\$24,342 16	
Advertising	26 00	
		24,368 16

Everett Street Bridge, over Boston, Revere

Beach & Lynn Railroad:

Lumber	\$1,394 41	
New concrete bituminous surface	508 36	
		1,902 77

Fairmount Avenue Bridge:

John F. Shea Company, Inc.	\$9,163 10	
Advertising	28 50	
		9,191 60

Public Landing, Northern Avenue:

Advertising	26 50
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Northern Avenue Bridge:

New bushings	1,055 19
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Summer Street Bridge, over Fort Point Channel:

W. H. Ellis & Son Company	\$3,828 37	
Advertising	74 50	
		3,902 87

Temple Street Bridge:

Coleman-Doyle Company	2,291 44
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Warren Bridge:

A. Orlando, Inc.	\$60,488 36
Material — lumber	874 30
Advertising	53 00

\$61,415 96

West Newton Street Bridge:

Atlantic Steel Company	\$2,094 04
Advertising	26 50

2,120 54

\$214,934 20

BRIDGES — CONSTRUCTION OF.

Meridian Street Bridge:

M & R Construction Company . . .	\$32,699 92
Advertising	27 50

\$32,727 42

SUMMARY.

Expenditures from Special Appropriations.

	Balances from 1949.	Total Credits, Including Balances Carried Over and Transfers.	Expended During Year 1950.	Unexpended Balances December 31, 1950.
Bridges, repairs, etc.....	\$99,215 95	\$449,215 95	\$241,934 20	\$207,281 75
Bridges, construction of..	2,348,153 42	2,348,153 42	32,727 42	2,315,426 00
Totals.....	\$2,447,369 37	\$2,797,369 37	\$274,661 62	\$2,522,707 75

Draw Openings, 1950.

BRIDGES.	STEAMERS.			SAILING VESSELS.			TUOS.			BAROES.			ALL OTHERS.			TOTAL NUMBER OF VESSELS.			TOTAL NUMBER OF CARGOES.	TOTAL NUMBER OF OPENINGS.
	Day.		Total.	Day.		Total.	Day.		Total.	Day.		Total.	Day.		Total.	Day.		Total.		
	Night.			Night.			Night.			Night.			Night.			Night.				
Broadway.....	19	3	22	0	0	0	29	1	30	0	0	0	30	1	31	78	5	83	34	208
Charlestown.....	0	4	4	0	0	0	145	81	226	278	215	493	121	52	173	544	352	896	223	635
Chelsea North †.....	163	7	170	0	0	0	1,101	82	1,183	199	73	272	25	1	26	1,488	163	1,651	304	654
Chelsea South.....	20	9	29	0	0	0	632	322	954	225	154	379	2	0	2	879	485	1,364	242	817
Chelsea Street.....	1,108	464	1,632	0	0	0	3,976	580	4,556	356	105	461	731	118	849	6,231	1,267	7,498	1,181	3,573
Congress Street.....	82	48	130	4	0	4	1,098	264	1,362	148	35	183	517	5	522	1,849	352	2,201	613	1,084
Dover Street.....	18	0	18	1	0	1	466	0	466	3	0	3	461	0	461	949	0	949	254	541
L Street *.....	0	0	0	2	1	3	327	156	483	381	252	633	914	1,361	2,275	1,624	1,770	3,394	964	3,014
Malden.....	26	0	26	0	0	0	590	118	708	515	221	736	416	108	524	1,547	447	1,994	454	1,595
Meridian Street †.....	323	18	341	0	0	0	3,630	678	4,308	1,573	621	2,194	967	269	1,236	6,493	1,586	8,079	1,343	4,098
Northern Avenue.....	55	53	108	5	5	10	2,185	478	2,663	473	48	521	1,269	173	1,442	3,987	757	4,744	718	2,511
Summer Street.....	51	49	100	0	0	0	966	277	1,243	83	32	115	686	65	751	1,786	423	2,209	401	1,077
Warren.....	83	81	164	127	74	201	1,081	566	1,647	986	750	1,736	1,649	971	2,620	3,926	2,442	6,368	1,265	3,753
Totals.....	2,008	736	2,744	139	80	219	16,226	3,603	19,829	5,220	2,506	7,726	7,788	3,124	10,902	31,381	10,049	41,430	7,996	23,560

* Now Summer Street, over Reserved Channel.

† Bridge closed permanently March 6, 1950.

‡ Bridge closed for rebuilding.

FERRY SERVICE.

FINANCIAL STATEMENT FOR THE YEAR ENDING
DECEMBER 31, 1950.*Toll Receipts.*

Total cash receipts during the year	\$24,522 31
Cash in hands of tollmen at beginning of year	\$60 00
Cash paid to City Collector	\$24,522 31
Cash in hands of tollmen at the end of the year	\$60 00

Breakdown of Toll Receipts for the Year 1950.

From foot passengers	\$4,850 96
From vehicles	19,671 35
	<hr/>
	\$24,522 31

	From Foot Passengers.	From Vehicles.
Boston side	\$2,401 89	\$9,461 60
East Boston side	2,449 07	10,209 75
	<hr/>	<hr/>
Totals	\$4,850 96	\$19,671 35

Additional Income Received by the Ferry.

Telephone commissions	\$26 06
Cleaning of telephone booth at ferry and rental of stand	\$54 00
Concession, Mills Automatic Merchandising Corporation	\$85 00
Sale of Ferryboat "R. J. Palumbo" on April 12, 1950 to the Delaware River Ferry Company, Louis Kapelski, Assistant Treasurer	\$22,500 00

TRAVEL ON THE SOUTH FERRY FROM JANUARY 1,
1950, TO DECEMBER 31, 1950.

Foot passengers	485,096
Handcart	4,881
One- and two-horse vehicle with driver	3,259
Passenger auto with driver and one passenger	140,545
Truck, six tons or less	19,999
Truck, over six tons	11,050

SUMNER TUNNEL SERVICE.

Annual Traffic by Classification for the Year 1950.

CLASS.	TOLL.	DESCRIPTION.	No. of Vehicles.
1.	\$0 20	Truck not in excess of 2 tons capacity.	
		Tractor without trailer	541,857
2.	0 20	Passenger car	8,430,357
3.	0 20	Motorcycle	2,604
4.	0 25	Truck over 2 tons and up to 5 tons capacity.	
		Tractor with trailer over 2 tons and up to 5 tons capacity	39,968
5.	0 20	Passenger car with trailer	11,099
6.	0 35	Truck over 5 tons and up to 10 tons capacity.	
		Tractor with trailer over 5 tons and up to 10 tons capacity	15,336
7.	0 20	Tractor with trailer not in excess of 2 tons capacity	991
8.	1 00	Truck over 10 tons capacity. Tractor with trailer over 10 tons capacity	568
9.	0 35	Bus with or without passengers	107
* City-owned			† 240,813
Total traffic			9,283,700

* MTA, Eastern Massachusetts Railway, and Airways Transportation Company buses are included in this classification. (January 1 to January 6, only.)

† 724 MTA, 161,378 Eastern Massachusetts Railway, and 608 Airways Transportation Company buses at 35 cents are included in this total.

Comparative Annual Traffic Count.

1946	1947	1948	1949	1950
8,432,721	8,748,162	8,754,545	9,162,266	9,283,700

SUMNER TUNNEL.

Comparison of Receipts, Expenditures, Interest and Sinking Fund Requirements.
1946 to 1950, Inclusive.

	1946	1947	1948	1949	1950
Operating expenditure.....	\$334,345 71	\$395,060 35	\$428,733 58	\$482,982 71	\$464,522 41
Balance to next year.....	14,256 34	11,850 05	4,298 18	—	—
Interest requirements.....	\$31,207 50	\$75,673 75	\$36,876 25	\$37,611 25	\$32,453 75
Sinking fund requirements...	†	† ‡ 2 80	†	†	† ‡ 92 20
Total expenses.....	\$1,179,809 55	\$1,282,586 95	\$1,269,908 01	\$1,320,593 96	\$1,297,068 38
Receipts.....	\$1,709,491 00	\$1,758,149 30	\$1,776,655 00	\$1,853,049 84	\$1,863,035 00
Balance from previous year...	6,293 00	14,256 34	11,850 05	4,298 18	—
Total receipts.....	\$1,715,784 00	\$1,772,405 64	\$1,788,505 05	\$1,857,348 02	\$1,863,035 00
Net result.....	* \$535,974 45	* \$489,818 69	* \$518,597 04	* \$536,754 06	* \$565,966 64

* Excess.

† None required.

‡ Refunded tolls.

II — HIGHWAY SECTION.

PAVING SERVICE.

SUMMARY OF BUDGET APPROPRIATIONS.

Maintenance.

Appropriation for 1950	\$1,243,484 00
Expenditures	1,233,367 29
Balance unexpended	<u>\$10,116 71</u>

Reconstruction of Streets.

Appropriation for 1950	\$215,076 71
Expenditures	106,976 44
Balance unexpended	<u>\$108,100 27</u>

Public Ways, Construction of (Revenue).

Appropriation for 1950	\$161,092 11
Expenditures	158,890 82
Balance unexpended	<u>\$2,201 29</u>

Public Ways, Construction of (Non-Revenue).

Appropriation for 1950	\$3,678,739 82
Expenditures	1,937,386 42
Balance unexpended	<u>\$1,741,353 40</u>

Sidewalks, Construction and Reconstruction of.

Appropriation for 1950	\$114,530 60
Expenditures	66,945 34
Balance unexpended	<u>\$47,585 26</u>

Snow Removal.

Appropriation for 1950	\$408,785 85
Expenditures	392,247 12
Balance unexpended	<u>\$16,538 73</u>

Street Signs.

Appropriation for 1950	\$11,534 32
Expenditures	8,354 09
Balance unexpended	<u>\$3,180 23</u>

The amount of money taken through the Permit Office was \$29,053.16; of this amount \$25,646.66 was deposited with the City Collector and \$3,406.50 was billed to the Public Service Corporations. There are now on file 2,288 bonds protecting the City of Boston against claims that may be made on account of the permits issued.

The regular forces of the Paving Service were employed as usual in the maintenance of public streets, resurfacing and patching macadam pavements, patching permanent pavements, such as asphalt and granite block, and maintaining gravel, brick and artificial stone sidewalks. In the snow removal season, division forces were engaged in spreading rock salt and sand on icy streets and also supervised plowing work done throughout the City by 247 contractors' hired plows after four snowstorms. Yard foremen and engineers supervised the operations of contractors hired on a force-account basis to remove snow with loaders, trucks, etc., after two snowstorms. All snow removal bills for plowing, hauling, force-account work, etc., were processed through the Highway Section office.

The following work was done in placing new street signs and replacing and repairing old street signs:

- 147 Street sign posts erected.
- 30 Hero street sign posts erected.
- 702 Street sign name plates installed.
- 72 Bent or broken posts repaired.
- 87 Hero signs replaced.
- 670 Street sign posts and frames painted.
- 74 Street sign frames repaired.

Contracts were awarded for the construction and reconstruction of 137 streets during the year, and 85 were completed. Work was also completed on 54 streets that were unfinished from 1949.

Some of the more important thoroughfares reconstructed during the year were:

Albany street, City Proper, from Broadway to Massachusetts avenue.

Beacon street, Brighton, from Brookline line to Park Drive.

Blue Hill avenue, Dorchester, from American Legion Highway to Grove Hall.

Blue Hill avenue, Roxbury, from Dudley street to Warren street.

Boston street, Dorchester, from railroad bridge to Columbia road.

Bromfield street, City Proper, from Tremont street to Washington street.

Columbia road, Dorchester, from Edward Everett square to Blue Hill avenue.

Essex street, City Proper, from Washington street to Atlantic avenue.

Faneuil street, Brighton, from Market street to Goode-nough street.

St. James avenue, City Proper, from Arlington street to Berkeley street.

Warren street, Roxbury, from Dudley street to Blue Hill avenue.

Washington street, Dorchester, from Talbot avenue to Bowdoin street.

Washington street, Dorchester, from Bowdoin street to Columbia road.

Washington street, Dorchester, from Columbia road to Blue Hill avenue.

Western avenue, Brighton, from Soldiers Field road to northeast of Market street.

Winter street, City Proper, from Washington street to Tremont street.

The Paving Service of the Highway Section did not get started on a program of building highways and sidewalks until May, 1950.

Because of the shortage of engineers in this division, engineers were borrowed from another division and trained in highway construction.

It was necessary to work the engineers nights, Saturdays, and Sundays, as streets in downtown Boston had to be constructed nights and over week ends.

A new system was initiated in the checking of the construction of highways to guarantee that the City received the dollar value of the construction. Cores were taken at certain intervals to test the depth of the pavements and sidewalks. Another method of checking was by cross-section and the signed ticket method.

A close watch was kept on all jobs by the Public Works Commissioner and his principal assistants and various other aides. The City of Boston has received, this year, more dollar value in construction than ever before.

Some of the arteries resurfaced this year were Blue Hill avenue, from Dudley street to Grove Hall; Albany street, from Broadway to Massachusetts avenue; Washington street, Dorchester, from Grove Hall to Codman square; Boston street, from railroad bridge to Edward Everett square.

Streets resurfaced in downtown Boston, nights and week ends, were: Chatham street, Commerce street, La Grange street, Lewis street, Mercantile street, Merchants Row, Tamworth street, Elm street, Friend street, Kingston street, Union street, Bromfield street, Winter street, Essex street, Harrison avenue, Battery-march street, Broad street, Central street, Congress street, Milk street, Wendell street, Wharf street, St. James avenue, Eisen street, Albany street, Custom House street, and Columbia street — for a total of four miles, and at a cost of \$275,000.

In the Brighton district the following streets were constructed or resurfaced: Summit avenue, Sutherland road, Denby road, Atkins street, Hunnewell avenue, Presentation road, Oak Square avenue, Arlington street, Dunclee street, Etna street, Faneuil street, widened from Market street to Parsons street; Harriet street, Lane park, Langley road, Tip Top street, Guest street, Life street, Beechcroft street, Brook street, Turner street, Warren street — for a total of four miles, and at a cost of \$260,000.

In the Jamaica Plain-West Roxbury district the following streets were constructed: Brookley road, Rossmore road, Williams street, Hyde Park avenue, from Forest Hills square to Walk Hill street; Call street, Amory street, Albano street, Bradwood street, Gloria road, Walk Hill street, Annafran street, Rosecliff street, Whitford street, Haslet street, Gilman street, Manning street, Corey street, Archdale road, Biltmore street, Malcolm road, Seaverns avenue, Whitcomb avenue, Sunnybank road, Freeman avenue, Acacia road, Ansonia road, Worley street, Ennis road — for a total of six miles, and at a cost of \$305,000.

In the Hyde Park area the following streets were constructed: Avila road, Linwood street, Valencia road, Hautevale street, West street, Skyline road, Gilman street, Mattakeset street, Garfield avenue, Washington street, Imbaro road, Blake street — for a total of approximately three miles, and at a cost of \$175,000.

In the Dorchester district the following streets were constructed: Holmfield avenue, Driscoll Drive, Lombard street, Rangeley street, Hill Top street, Park street, Crescent avenue, Greenbrier street, Ripley road, Buttonwood street, Hineckley street, Morrill street, Rowell street, Wilbur street—for a total of approximately five and one-half miles, and at a cost of \$250,000.

In the Roxbury district the following streets were constructed: Bynner street, Catawba street, Cheney street, Hutchings street, Laurel street, Haviland street, Day street, Oswald street, Wensley street, Warren street, Blue Hill avenue, Gay Head street, Terrace street—for a total of approximately four miles, and at a cost of \$200,000.

In the Charlestown district the following streets were constructed: Harvard street, Laurel street, Union street, Call street, Chelsea street, Joiner street—for a total of about one mile, and at a cost of \$42,000.

Miscellaneous streets in South Boston and East Boston amounted to approximately one mile, and at a cost of \$53,000.

The grand total in miles of streets constructed and reconstructed amounts to twenty-eight and five-tenths, and the cost of same amounts to \$1,560,000.

In every district defective sidewalks were replaced, and \$110,000 was spent to eliminate, as far as possible, this hazard. This was the greatest of all years for sidewalk construction.

In Charlestown, brick sidewalks were replaced by artificial stone in the following streets: Boyle street, Cordis street, Edgeworth street, Frothingham avenue, Henley street, Ludlow street, South Eden street, Sullivan street—\$16,000 was spent for 50,000 square feet of sidewalks, at the low cost of 31 cents per square foot.

In the East Boston district \$23,000 was spent replacing defective brick sidewalks with artificial stone in the following streets: Addison street, Princeton street, Putnam street, White street, Breed street, Bremen street, Neptune road. These were replaced at the low cost of 33 cents per square foot.

In the South Boston district \$24,801 was spent to replace 76,000 square feet of defective brick sidewalk with artificial stone, at the low cost of 32 cents per square foot, in the following streets: East Second

street, East Fifth street, East Sixth street, Columbia road, Farragut road, I street, P street, and Brewster street.

Contracts for re-laying sidewalks in Dorchester have not been completed, but approximately \$30,000 has been awarded for this purpose.

More money was obtained from the state for chapter 90 work than ever before. This sum amounted to \$350,000, and was used on some of our main arteries: Columbia road, from Edward Everett square to Blue Hill avenue—the twenty-five foot reservation was reduced to a seven-foot divisional strip and permitted rebuilding two new roadways to eliminate traffic congestion.

Blue Hill avenue was likewise widened and reconstructed, from Grove Hall to American Legion Highway.

Western avenue, Brighton, was rebuilt, from Market street to Soldiers Field road.

Contracts have been awarded to build with state aid, the following streets: River street, Dorchester, from Blue Hill avenue to Pierce square; Centre street, West Roxbury, from May street to Weld street; Washington street, West Roxbury, from Walk Hill street to Roslindale square.

Approximately \$200,000 was spent by the district yard forces in building or rebuilding new or defective sidewalks with cement concrete or bituminous concrete. Old pavements were constantly patched or covered by these forces throughout the year.

A special unit used as shock troops aided in repairing six major water breaks that occurred during the year.

LIGHTING SERVICE.

EXPENDITURES, JANUARY 1, 1950, TO DECEMBER 31, 1950.

Electric Lighting:

Boston Edison Company	\$867,006 16	
Boston Consolidated Gas Company	35,060 98	
		\$902,067 14

Gas Lighting:

American Service Company	\$90,601 19	
Boston Consolidated Gas Company	89,552 40	
		180,153 59

Salaries and Wages:

Division Engineer (part of)	\$57 73	
Executive clerk	3,891 32	
Clerk	1,166 43	
Clerk	2,297 73	
Lamp inspector	3,193 08	
	<hr/>	\$10,606 29

Construction:

Installing, removing and re- locating lamps	\$30,592 10	
	<hr/>	30,592 10

Office Expenses:

Printing	\$103 20	
Postage	26 00	
Advertising	23 00	
	<hr/>	152 20

Miscellaneous:

Electric posts	\$1,171 15	
Globes, domes, mantles, etc.	27,835 76	
Gasoline	21 26	
	<hr/>	29,028 17

Total	<hr/>	<u>\$1,152,599 49</u>
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Total appropriations	\$1,162,460 86
Total expenditures	1,152,599 49

Unexpended balance	<u>\$9,861 37</u>
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The following is a statement of the work done by the Lighting Service during 1950:

Electric lamps of 2,000 c.p. (twin 1,000) were installed on Columbia road (69), Blue Hill avenue (10), Dorchester.

Electric lamps of 1,500 c.p. were installed on Chelsea street (26), Park street (1), Warren street (1), Water street (9), Ferrin street (1), Charlestown.

Electric lamps of 1,000 c.p. were installed on Chiswick road (1), Brighton; Spice street (1), Charlestown; St. James avenue (1), Tremont street (1), Warren avenue (1), City Proper; Columbia road (20), Gallivan Boulevard (1), Gibson street (4), Dorchester; Ashley street (2), London street (1), Princeton street (1), East Boston; River street (1), Hyde Park; Blue Hill avenue (1), Centre street (1), Crawford street (1), Dudley

street (1), Roxbury; Dorchester avenue (3), East Broadway (1), East Third street (1), West First street (1), Old Harbor street (1), South Boston; American Legion Highway (1), Brookside avenue (2), Spring street (1), Walnut avenue (1), West Roxbury.

Electric lamps of 600 c.p. were installed on Roland street (2), Charlestown; Blue Hill avenue (11), Dorchester; Old Harbor street (8), South Boston; Hyde Park avenue (1), West Roxbury.

Electric lamps of 400 c.p. were installed on Groton street (1), Lenox street (2), Mayo street (1), City Proper; Ditson street (2), Dorchester; East Fourth street (2), East Third street (2), Midway street (8), West Fifth street (1), South Boston; Brookside avenue (9), West Roxbury.

Electric lamps of 250 c.p. were installed on Lorne street (5), Marmion street (4), Wilson street (1), Franklin Hill avenue (5), Harvard street (6), Austin street (1), these latter lamps were increased from 100 to 250 c.p. All these lamps are in the West Roxbury district.

During the year 157 lamps of 100 c.p. were installed in various suburban areas and 1,163 gas lamps were removed and replaced by an equal number of electric lamps of 100 c.p.

Electric fire alarm lamps were installed on Chelsea street (2), Decatur street (1), Joiner street (1), Main street (2), Rutherford avenue (1), Charlestown; Dorchester avenue (1), Draper street (1), Westville street (1), Willowood street (1), Dorchester; Turtle Pond Parkway (2), Hyde Park; Ashley street (1), Chestnut avenue (1), Cobden street (1), Creighton street (1), Fisher avenue (1), Gay Head street (1), Harold street (1), Hayden street (1), Heath street (1), Homestead street (1), Hutchins street (1), Quincy street (1), Sterling street (1), Warren street (1), Winthrop street (1), Roxbury; Beech street (1), Brown avenue (1), Cummins Highway (1), Eldridge street (1), Florence street (1), Forest Hills street (1), Glendower road (1), Metropolitan avenue (1), Prospect avenue (1), Seymour street (1), South street (1), Walworth street (1), West Roxbury.

PAVING SERVICE.

STREET WORK DONE IN 1950 BY CONTRACT.

SUMMARY.

Earth and water box excavation	69,534 cubic yards.
Rock and wall excavation	822 cubic yards.
Bank gravel	63,340 tons.
Crushed stone	1,922 tons.
Existing concrete base removed	8,271 square yards.
Existing pavement removed	38,937 square yards.
Straight edgestone set	37,601 linear feet.
Circular edgestone set	2,599 linear feet.
Corners set	1,764
Precast straight edgestone set	680 linear feet.
Edgestone reset	56,212 linear feet.
Concrete base, Class B, 6 inches in depth	33,199 square yards.
Extra concrete	78 cubic yards.
Bituminous macadam base	57,432 square yards.
Granite block pavement	405 square yards.
Granite block hip gutters	646 square yards.
Three-inch sheet asphalt pavement	74,084 square yards.
One and one-half-inch sheet asphalt pavement	169,401 square yards.
Asphalt binder	13,340 tons.
Bituminous concrete pavement	7,258 tons.
Bituminous concrete base	57,291 tons.
Artificial stone sidewalks	851,410 square feet.
Bituminous concrete sidewalks	18,490 square yards.
Artificial stone foundation	8,333 cubic yards.
Covers reset	3,655
Bradley heads reset	9
Courses of brick	6,599
Concrete around boxes	178 cubic yards.
Loam spaces	154 square yards.
Parking meters reset	43

YEARLY REPORT OF WORK DONE BY DEPARTMENT FORCES FOR 1950.

Brick sidewalks, laid and relaid	9,284 square yards.
Gravel sidewalks, relaid	7,750 square yards.
Artificial stone sidewalks, laid (new)	3,812 square feet.
Artificial stone sidewalks, relaid (old)	147,087 square feet.
Bituminous concrete sidewalks	38,290 square yards.
Block gutters, laid	207 square yards.
Granite block roadway, laid	384 square yards.
Edgestone reset (old)	4,773 linear feet.
Macadam roadway patched	117,631 square yards.
Macadam roadway resurfaced	8,137 square yards.
Street cleaning	8,492 cubic yards.
Snow removal	37,140 cubic yards.

Objects of Expenditures from Maintenance Appropriation, Classified by Districts, from January 1, 1950,
to December 31, 1950.

Districts.	Macadam Repairs.	Granolithic Sidewalk Repairs.	Removal of Snow.	Street Cleaning.	Edgestone, Sidewalk and Gutter Repairs.	Bituminous Sidewalk Repairs.	Miscellaneous.	Total.
South Boston and Dorchester North.....	\$9,958 21	\$9,223 71	\$4,163 08	\$4,571 03	\$12,372 95	\$1,130 77	.....	\$41,419 75
East Boston.....	19,891 48	3,075 88	3,232 20	.....	6,028 66	11,550 75	.....	43,778 97
Charlestown.....	8,238 77	7,816 24	2,994 53	1,987 32	1,546 77	7,802 25	.....	30,385 88
Brighton.....	16,746 42	20,559 48	6,162 60	5,257 42	808 20	657 00	.....	50,191 12
West Roxbury.....	37,956 89	28,774 88	8,889 35	4,670 92	3,881 63	5,657 57	.....	89,831 24
Dorchester.....	10,131 65	13,092 55	3,703 96	1,065 05	1,608 37	1,207 49	.....	30,809 07
Roxbury South, and Jamaica Plain.....	33,354 32	13,509 68	3,503 07	3,000 85	3,291 16	13,274 37	.....	69,933 45
City Proper.....	29,663 79	13,352 39	1,833 09	3,295 91	3,289 76	416 92	.....	51,851 86
Aslmont.....	16,757 00	20,026 09	6,349 17	8,277 37	6,020 20	.....	.....	57,429 83
Hyde Park.....	10,472 57	3,063 83	2,455 65	4,426 52	8,823 22	5,925 72	.....	35,167 51
Totals.....	\$193,171 10	\$132,494 73	\$43,286 70	\$36,552 39	\$47,670 92	\$47,622 84	\$732,568 61	\$1,233,367 29

Miscellaneous includes: Fence repairs, \$2,677.84; granite block roadway repairs, \$372.93; street signs, \$25,378.63; miscellaneous, \$704,139.21.

Special Appropriations: Public Ways, Construction of (revenue), \$158,800.82; Public Ways, Construction of (non-revenue), \$1,937,386.42; Reconstruction of Streets (revenue), \$106,976.44; Sidewalks, Construction and Reconstruction of (revenue), \$66,945.34; Snow Removal, \$392,247.12; Street Signs, \$8,354.09; Totals, Specials, \$2,670,800.23.

Totals (Maintenance and Specials), \$3,904,167.52.

APPENDIX C.

REPORT OF THE DIVISION ENGINEER OF
THE SANITARY DIVISION.

BOSTON, January 2, 1951.

To the Commissioner of Public Works.

DEAR SIR:

Herewith, I submit a statement of the activities and expenditures of the Sanitary Division of the Public Works Department for the year ending December 31, 1950:

This report is a departure, in some respects, from those of previous years, particularly in the method of arriving at the true cost of the work done. In the past, with the exception of the reports for the years 1938 to 1943, inclusive, there was shown merely a distribution of the budget appropriations of the Sanitary Division, but since important elements of cost were not included in the item of motor vehicles, the true cost of operations could not be obtained.

In the years from 1938 to 1943, inclusive, the Sanitary Division received reports on the costs of individual vehicles, and these were added to the Sanitary Division appropriations, thus giving an approach to the true cost. However, these records were discontinued in 1944.

In 1950, with the institution of the Automotive Division, there was made available to us a complete breakdown of all motor vehicle costs, including depreciation. By including the total amount chargeable to the Sanitary Division, it is now possible to arrive very closely at the true cost of operations.

These considerations should be borne in mind in comparing this report with those of previous years.

An examination of the expenditures for the last 20 years shows a drop from \$3,175,568.77 in 1930 to a "low" in 1940 of \$2,031,260.58, rising steadily to a "high" in 1949 amounting to \$5,419,665.82. In 1950, however, these expenditures decreased to \$5,098,726.84.

The total cost of operations is arrived at as follows:

Budget expenditures (paid)	. . . . .	\$5,098,726 84
Budget expenditures (unpaid)	. . . . .	4,474 76
Motor vehicle charge	. . . . .	223,329 86
Total cost	. . . . .	<u>\$5,326,531 46</u>

This cost falls into three main subdivisions, as follows:

Contract waste collection and disposal	. . . . .	\$3,115,675 18
Street cleaning	. . . . .	2,137,423 14
Preventive street cleaning	. . . . .	73,433 14
Total cost	. . . . .	<u>\$5,326,531 46</u>

However, for the purpose of comparing with previous years, only the budget expenditures can be considered, and examination of these figures shows a decrease this year under last year amounting in all to \$320,938.98, largely due to the placing of the South End district under contract.

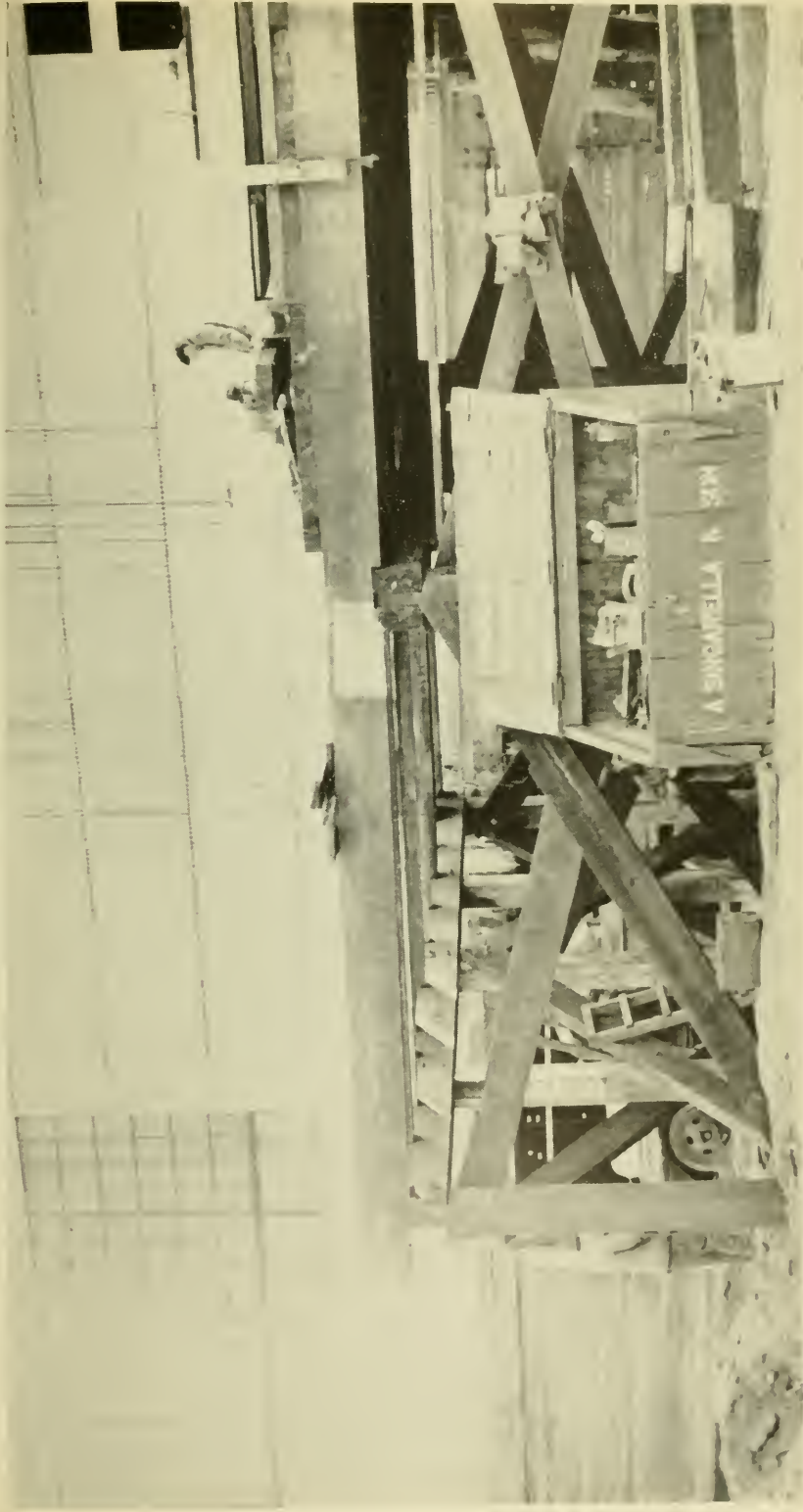
This decrease is further subdivided as follows:

(a) Waste collection and disposal	. . . . .	\$239,701 80
(b) Street cleaning	. . . . .	13,984 45
(c) Other	. . . . .	67,252 73
Total net decrease	. . . . .	<u>\$320,938 98</u>

(a) *Waste Collection and Disposal.*—The decrease in the waste collection and disposal account is explained as follows:

1. Decrease in collection and removal contracts	. . . . .	\$38,497 59
2. Decrease in general disposal contract	. . . . .	10,908 98
3. Decrease in South End District payroll	. . . . .	213,399 62
		<u>\$262,806 19</u>
Less amount of the South End District contract	. . . . .	152,400 00
		<u>\$110,406 19</u>
Elimination of motor vehicle expense and other items formerly in Sanitary Division budget	. . . . .	129,295 61
Total net decrease	. . . . .	<u>\$239,701 80</u>

VICTORY ROAD GARBAGE TRANSFER STATION



City Forces Constructing and Filling Crib for Extension to Victory Road Garbage Transfer Station; 5,000 Square Feet of Land Was Thus Reclaimed at No Cost to the City for Materials.

1. *Decrease in Collection and Removal Contracts.*—

The waste collection and removal contracts for the year 1950 were approved by the previous, outgoing, administration as follows:

Contracts at same prices as in 1949	\$2,053,218 60
New South End district contract	170,400 00
Total	<u>\$2,223,618 60</u>

These contracts, in the opinion of the Corporation Counsel, were invalid, and contracts for three months were negotiated at the same rates as the invalidated contracts, amounting to \$555,904.65.

For the remaining nine months of the year, however, a 2½ per cent reduction in the contract prices was obtained in all districts except the South End. In the South End district the contract price was reduced by \$2,000 per month for the nine months remaining in 1950.

A comparison of the 1949 and 1950 contract expenditures follows:

CONTRACT.	1949	1950			1950 Invalidated.
		3 Months.	9 Months.	Total.	
South End.....	None.	\$42,600.00	\$109,800.00	\$152,400.00	\$170,400.00
Other.....	\$2,053,218.60	513,304.65	1,501,416.36	2,014,721.01	2,053,218.60
Total.....	\$2,053,218.60	\$555,904.65	\$1,611,216.36	\$2,167,121.01	\$2,223,618.60

So that, not including the new South End district, there was a drop in 1950 in the expenditure for the contracts amounting to \$38,497.59. Furthermore, the amount expended for the South End district was \$18,000 less than had been contracted for by the previous administration, thus making a total saving of \$56,497.59.

2. *Decrease in General Disposal Contract.*— The disposal contract, which had been let by the previous administration in the amount of \$581,807, was likewise declared invalid, and negotiated as follows:

Three months at the 1949 rate of \$48,483.91 or . . .	\$145,451 73
Nine months at the rate ($2\frac{1}{2}$ per cent cut) of \$47,271.81 or	425,446 29
Total 1950 disposal contract	<u>\$570,898 02</u>

This figure represents a saving in the disposal contract of \$10,908.98.

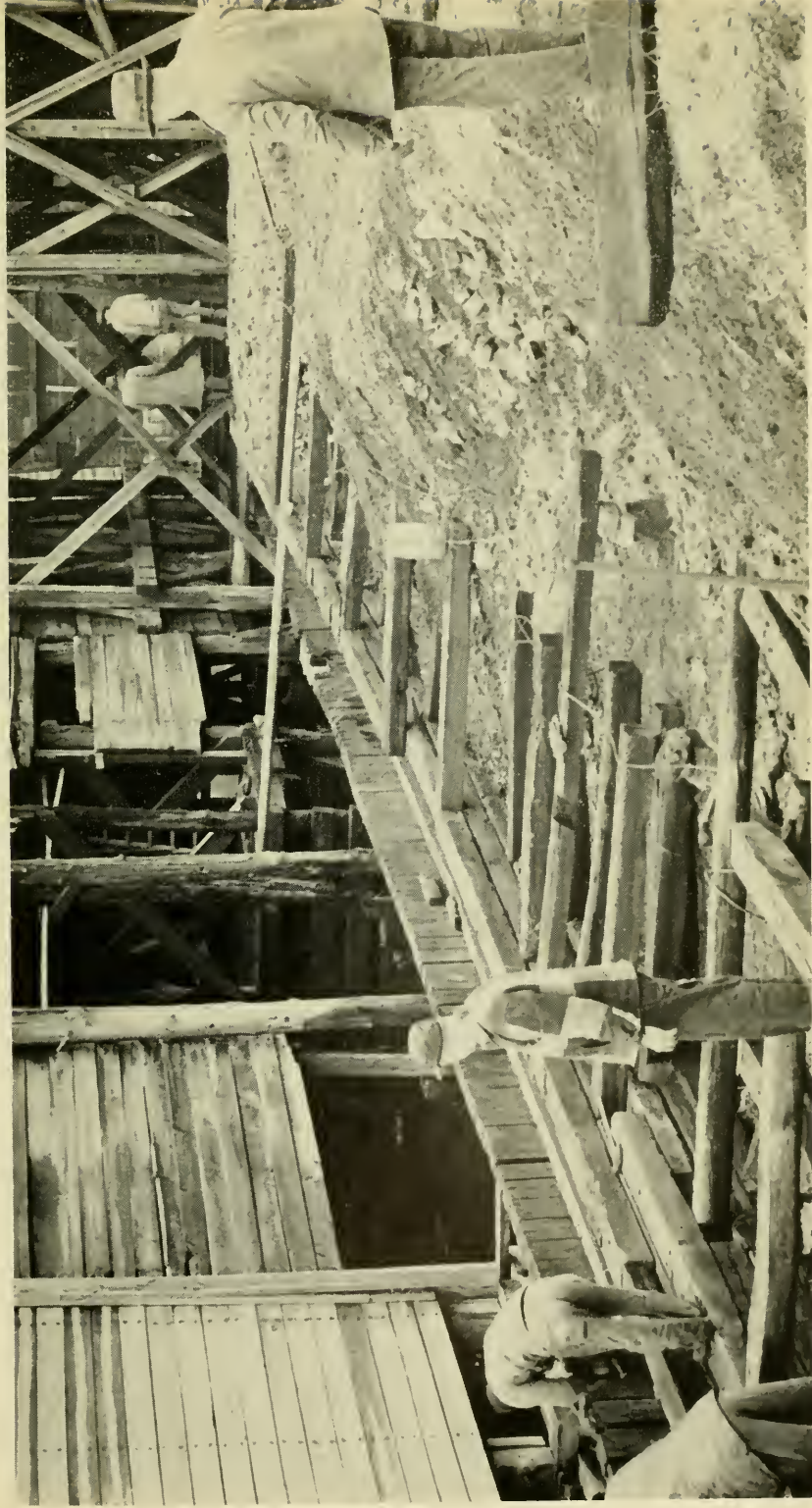
The total savings on account of the negotiation of the waste collection and removal and the disposal contracts amounted to \$67,406.81.

3. *Decrease in South End District Payroll.*—On January 1, 1950, the last remaining day-labor district, the South End, was placed under contract, so that the entire city is now being serviced by contractors. Because of the change in the South End district from day labor to contract, most of the men on that payroll were transferred to the street cleaning force, and the quota of the labor force was reduced to 444. During the year 1950, the number of these employees was reduced to 456, so that there remained 12 to go as of December 31, 1950.

(b) *Street Cleaning Decrease.*—The net decrease in the street cleaning account was \$13,984.45. Although there was an increase in the street cleaning payrolls, on account of the decrease in the waste collection payroll in the South End district, amounting to \$213,399.62, this was offset by the decrease in the motor vehicle item, which is no longer a part of the Sanitary Division budget, and the transfer of men, who were formerly paid by the Sanitary Division, from the garage to the Automotive Division payroll. In addition, there was a drop in the quota of the personnel which was in the process of liquidation, as noted above.

(c) *Other Items.*—The decrease in other items, amounting to \$67,252.73, is largely due to the fact that pension payments, which in 1949 amounted to \$61,389.37, were paid by the Retirement Board in 1950, while the injured payroll, which in 1949 amounted to \$4,498.03, is now being paid by the Workmen's Compensation Department.

MAKING LAND



This Extension to the Dumping Platform Was Constructed to Accommodate the Large Trucks Which Will Receive the Garbage in 1951.
The City Will Receive \$3,000 per Month for This Garbage.

Personnel changes in permanent force during the year 1950:

Total personnel January 1, 1950	*870
Transfers in (from other departments and divisions)	4
New appointments	22
Reinstatements	1
	— 27
	897
Deaths	13
Resignations	4
Retirements	18
Transfers out	31
Discharged or terminated	24
	— 90
Total personnel January 1, 1951	*807

* Includes one military leave. Net loss of 63 employees.

Work Accomplished.— During this year, an engineering report on incineration was made by Thomas Worcester, Inc.

A contract was let for the construction of the foundation wall for a new office building at the South Boston District yard.

Demolition of wooden buildings was accomplished at the Western Avenue, Brighton, yard, and at the Gibson street, Dorchester, city yard. In the case of the Gibson Street yard building, the contractor removed all the material. The material from the Western Avenue building was retained by the city, and used in the construction of the Victory Road Garbage Transfer Station.

Reconstruction was accomplished at the Victory Road Garbage Transfer Station for the delivery of garbage in 1951. A contract was let for the construction of concrete footings on existing piles. A contract was also awarded for the construction and the framing of the platform, using material from the Western Avenue city yard, mentioned above. The decking, cribbing, and filling work was performed by city forces, and this reconstruction was completed on December 31. Thus, with the expenditure of about \$2,500, for contracts, the city forces were able to make land, and create a facility which, conservatively, is worth over \$20,000.

One of the noteworthy achievements of the Public Works Department during the year 1950 was the adoption of a new policy in the storage of salt, and its implementation by the forces of the Sanitary Division.

Formerly, salt was received by rail in box cars, shovelled by hand into trucks, and deposited into hoppers at Ward street for use as required on slippery streets.

The new policy involves the decentralization of storage to 13 paving district yards. Each yard now has a mechanical loader which loads the local trucks.

It is the function of the Sanitary Division to transfer the salt from the railroad to the various yards.

The work of shovelling by hand is so arduous that it is often difficult to procure sufficient men to do the work, with the result that cars have been delayed, and charges for demurrage frequent.

Many experiments and devices were tried to improve these conditions, without success, until it was proposed to deposit the salt directly into trucks from the cars. To this end, the New York, New Haven & Hartford Railroad Company made available a trestle under which trucks could be driven, after alteration by the sanitary shop forces.

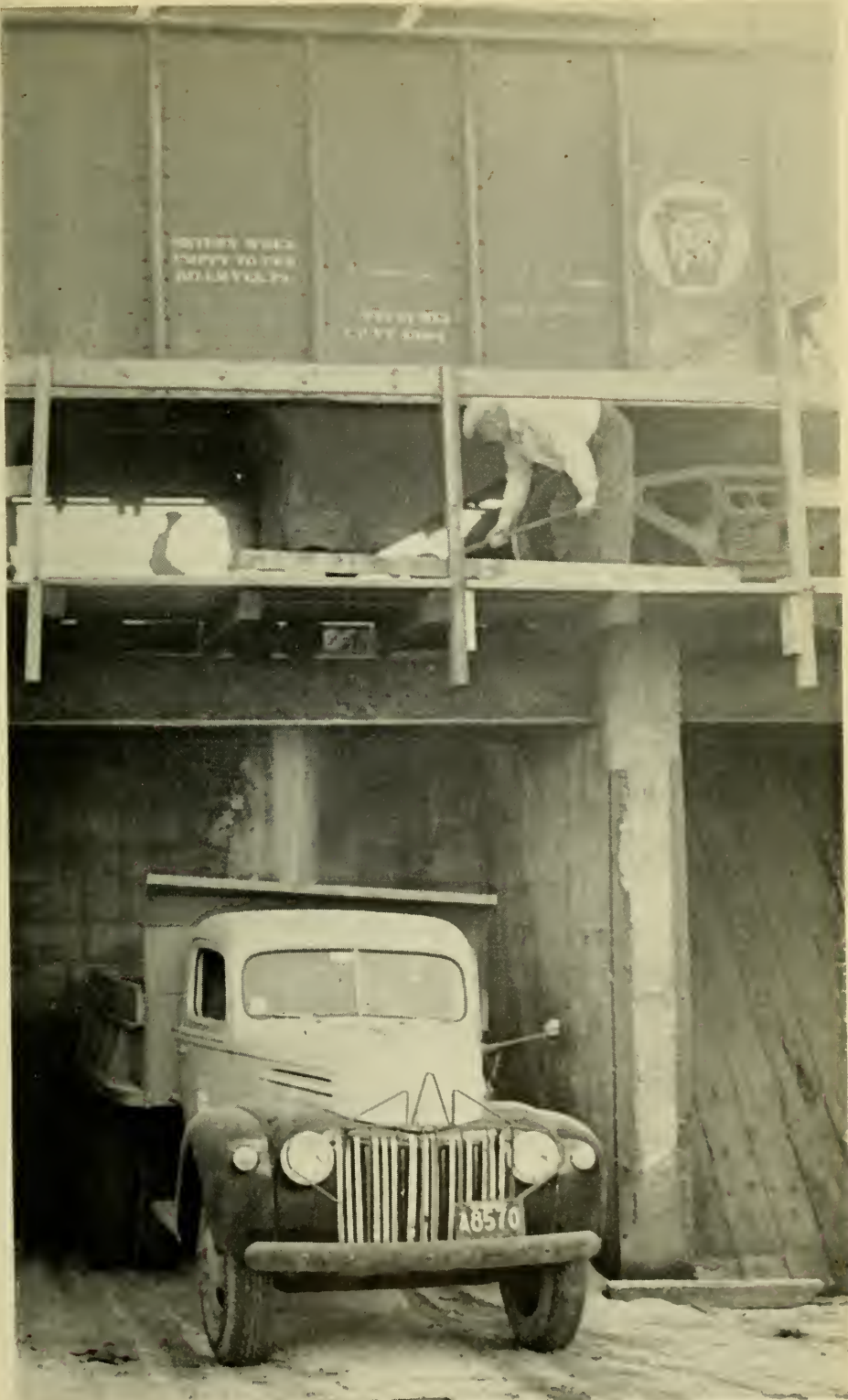
At first, box cars were chuted into the trucks, but this still required hand labor. Then, it was found that cement cars were available with drop-bottom hoppers. The city forces cut openings at the proper locations, so that a car could be emptied directly into trucks below.

All salt is now shipped in this way, with no hand labor required, and it is possible to empty a car in one and one-half hours instead of five or six.

In addition to the above, a monthly averaging agreement was entered into with the railroad company, with the result that there has been no demurrage charge for some months.

Respectfully submitted,

ADOLPH J. POST,
Division Engineer.



Here Rock Salt for Street Application Is Dropped Directly from the Cement Cars into the Truck Below. Formerly, Men Had to Shovel the Salt onto the Ground from Box Cars and Load the Trucks by Hand.

TABLE I.
Total Cost for the Collection and Disposal of Ashes and Garbage by Districts and Cost Per Cubic Yard.

Number.	District.	Population.	MIXED REFUSE.		GARBAGE.		Total Cost.	Total Cost Per Capita.
			Cost.	Per Capita.	Cost.	Per Capita.		
1.	South Boston.....	55,665	\$227,286 00	\$4.083	\$6,861 62	\$0.123	\$234,147 62	\$4.206
2.	East Boston.....	50,086	119,339 16	2.383	3,639 90	0.072	122,979 06	2.455
3.	Charlestown.....	24,244	90,870 62	3.748	—	—	90,870 62	3.748
4.	Brighton.....	72,475	341,740 18	4.715	20,469 55	0.283	362,209 73	4.998
5a.	West Roxbury.....	49,279	109,261 51	2.217	15,147 75	0.308	124,409 26	2.525
5b.	Jamaica Plain.....	39,243	104,093 42	2.653	11,437 49	0.291	115,530 91	2.944
6a.	Dorchester North.....	90,550	264,125 56	2.917	35,589 04	0.393	299,714 60	3.310
6b.	Dorchester South.....	103,149	300,766 22	2.916	40,525 93	0.393	341,292 15	3.309
7a.	Elm Hill.....	22,323	59,197 99	2.652	4,819 79	0.216	64,017 78	2.868
7b.	Dudley.....	39,833	126,035 33	3.164	11,369 59	0.286	137,404 92	3.450
7c.	Mission Hill.....	32,324	123,476 68	3.820	8,077 55	0.250	131,554 23	4.070
7d.	Roxbury.....	43,883	197,048 98	4.490	13,782 85	0.314	210,831 83	4.804
9.	South End.....	50,582	237,209 72	4.690	—	—	237,209 72	4.690
9a.	Back Bay.....	30,476	116,125 16	3.810	—	—	116,125 16	3.810
9b.	Stuart.....	23,818	134,226 33	5.635	—	—	134,226 33	5.635
10.	North and West Ends.....	47,782	312,076 75	6.531	14,407 99	0.303	326,544 74	6.834
11.	Hyde Park.....	25,732	60,544 22	2.353	6,062 30	0.236	66,606 52	2.589
	Totals.....	801,411	\$2,923,423 83	\$3.648	\$192,251 35	\$0.240	\$3,115,675 18	\$3.888

TABLE II.
Cost of Collection and Disposal of Refuse by Contract in City of Boston, 1950.

CONTRACT DISTRICT.	CONTRACTOR.	CHARACTER OF REFUSE.	Cubic Yards.	Cost Per District.	Cost Per Cubic Yard.	Population.	Total Cost Per Capita.
*South Boston	Ward General Contracting Company....	Mixed refuse.....	116,602				
		Garbage.....	3,520				
		Totals.....	120,122	\$234,147 62	\$1 949		
East Boston	Edward J. McHugh & Son.....	Mixed refuse.....	89,376				
		Garbage.....	2,726				
		Totals.....	92,102	\$122,979 06	\$1 336		
*Charlestown	Edward J. McHugh & Son.....	Mixed refuse.....	45,457				
		Garbage.....	—				
		Totals.....	45,457	\$90,870 62	\$1 999		
†Brighton	Anthony J. Ryan, Inc.....	Mixed refuse.....	161,341				
		Garbage.....	9,664				
		Totals.....	171,005	\$362,209 73	\$2 118		
West Roxbury	John J. Moore Company.....	Mixed refuse.....	75,802				
		Garbage.....	10,509				
		Totals.....	86,311	\$124,409 26	\$1 441		

Jamaica Plain.....	John J. Moore Company	Mixed refuse.....	78,069			
		Garbage.....	8,578			
		Totals.....	86,647	\$115,530 91	\$1 333	
†Dorchester, North	Coleman Brothers Corporation.....	Mixed refuse.....	217,518			
		Garbage.....	29,309			
		Totals.....	246,827	\$299,714 60	\$1 214	
†Dorchester, South.....	Coleman Brothers Corporation.....	Mixed refuse.....	217,519			
		Garbage.....	29,309			
		Totals.....	246,828	\$341,292 15	\$1 383	
†Elm Hill.....	Coleman Brothers Corporation.....	Mixed refuse.....	38,026			
		Garbage.....	3,096			
		Totals.....	41,122	\$64,017 78	\$1 557	
*Dudley.....	Marinucci Brothers & Co., Inc.....	Mixed refuse.....	57,311			
		Garbage.....	5,170			
		Totals.....	62,481	\$137,404 92	\$2 199	
*Mission Hill.....	Marinucci Brothers & Co., Inc.....	Mixed refuse.....	62,980			
		Garbage.....	4,120			
		Totals.....	67,100	\$131,554 23	\$1 961	
*Roxbury	Marinucci Brothers & Co., Inc.....	Mixed refuse.....	85,437			
		Garbage.....	5,976			
		Totals.....	91,413	\$210,831 83	\$2 306	

TABLE II.—Concluded.

Cost of Collection and Disposal of Refuse by Contract in City of Boston, 1950.—Concluded.

CONTRACT DISTRICT.	CONTRACTOR.	CHARACTER OF REFUSE.	Cubic YARDS.	Cost Per District.	Cost Per Cubic Yard.	Population.	Total Cost Per Capita.
*South End.....	Anthony J. Ryan, Inc.....	Mixed refuse..... Garbage..... Totals.....	73,114 — 73,114	\$237,209 72	\$3 244		
*Back Bay	Dooley Brothers, Inc.....	Mixed refuse..... Garbage..... Totals.....	56,973 — 56,973	\$116,125 16	\$2 038		
*Stuart.....	Capitol Contracting Company.....	Mixed refuse..... Garbage..... Totals.....	73,178 — 73,178	\$134,226 33	\$1 834		
*North and West Ends.....	M. Doyle & Co., Inc.....	Mixed refuse..... Garbage..... Totals.....	133,735 6,200 139,935	\$326,514 74	\$2 334		
Hyle Park.....	Mary C. Bryan.....	Mixed refuse..... Garbage..... Totals.....	39,229 3,928 43,157	\$60,006 52	\$1 543		
Total.....	.....	Mixed refuse..... Garbage..... Totals.....	1,621,667 122,105 1,743,772	\$3,115,675 18	\$1 787		

* Disposal of garbage and refuse to Coleman Disposal Company.

† Disposal of rubbish only to Coleman Disposal Company.

APPENDIX D.

REPORT OF THE DIVISION ENGINEER OF
THE SEWER DIVISION.

BOSTON, January 2, 1951.

To the Commissioner of Public Works.

DEAR SIR:

I submit herewith statement of the activities and expenditures of the Sewer Division for the year ending December 31, 1950.

The activities of the Sewer Division during the year consisted of sewer construction at a contract cost of \$264,875.45, as shown on attached schedule of the work done, and the maintenance and operation of the sewer system at a cost of \$727,438.95.

Contract work consisted of the extension of the sewer system to provide drainage for new buildings and street construction and to eliminate cesspools.

Maintenance work consisted of the cleaning of 2,832 catch basins by contract and 4,133 by yard forces, the freeing of stopped sewers and catch basins, and the repair of sewers, manholes, and catch basins by the yard forces, and the operation of the pumping station and disposal works.

A new low-pressure heating plant and other mechanical changes are now in progress at Calf Pasture which, when completed, will result in an estimated saving in fuel costs of \$5,000 per year.

The work of extending the sewer system to provide drainage for new street construction, new building construction, and the elimination of cesspools will continue for many years in the future, and probably at the same rate as in the past. In addition, a long-range sewerage works program provides for the extension of main line surface drain conduits such as Stony Brook, Shepard Brook, Maywood Brook, etc. The long-range program also includes the rebuilding of several miles of very old sewers that have settled or outlived their economic usefulness.

About 1,500 linear feet of corrugated pipe was laid by the yard forces between the old stone Shepard

Brook conduit in the yard of the Massachusetts Building Wrecking Company and North Harvard street, which provided substantial relief from street and cellar flooding experienced in the Shepard Brook drainage area.

Special sewer problems which have been given considerable study and investigation are listed, more or less, in the order of their importance, as follows:

1. *Calf Pasture Pumping Station.*

The renewing of worn-out main sluice and gallery gates, large discharge gate valves, changing the gate valve motors from DC to AC current.

The reconstruction of the flat roof areas of the station to replace defective roof plank and sheathing, that constitutes a danger to the employees, at an estimated cost of \$7,000. The renewing of the sluice gates and reconstruction of the roofs are absolutely necessary for the protection of the station, regardless of what final plan may be adopted for the disposal of sewage at this location. Under present business conditions it would require a year or more to replace the main sluice gates, which work could probably be paid for from the loan.

Other work of a more or less emergency nature required at Calf Pasture in order to properly protect the station, if it is to operate for the next five years or longer, is a new 2,400 KW transformer; replace obsolete main electrical operating board; install one or more motor-driven 75 m.g.d. sewage pumps to supplement the present pumps, the casings of which are wearing from the passage of grit. Other desirable improvements which have been studied and given consideration are the replacement of the present cage screens with mechanically cleaned bar screens, sealing off the open pump wells, now planked over, with a concrete slab. The open pump wells constitute the greatest danger of the station flooding, and consequent loss of the four horizontal pumps in the event of a power failure.

2. *Exclude the Entrance of Tidewater from the Boston Main Drainage Intercepting Sewers and from the Contributory Local Sewer System.*

Tidewater, and water from the marginal conduit, enters and surcharges the local sewer system contributory to the intercepting sewers, and in turn, the intercepting sewers through directly connected storm

overflows to local sewers which discharge either into the harbor or the marginal conduit. This happens because either the storm overflows (some of which are built of wood) leak but to a far greater extent from defective tide gates. The surcharging that takes place at every high tide reduces the velocity in the sewers, which tends to allow solids to settle out and grease to congeal, resulting in generally poor drainage. Much of the water that surcharges the sewers does not enter the interceptors, but flows back into tidewater with the receding tide. But sufficient water does enter the interceptors so that they are full, or nearly so, at all times because there is not sufficient elapsed time between low and high tide to allow the pumps at Calf Pasture to draw down the water stored in the interceptor. Even though there were no leakage of tidewater into the local sewers and the interceptors, both would surcharge during a heavy rainstorm, particularly if the storm occurred at high tide.

From the beginning of the operation of the main drainage system there has always been a crew for the maintenance of tide gates. Up to about 30 years ago, records indicate that their work was effective in excluding tidewater from the interceptor, but since then the work has not been satisfactory. Since 1938, every effort has been made to cut down tide-gate leakage, but it has not been successful because of worn-out gates (although many have been replaced), but more particularly because of the lack of mechanical ability of the men and their reluctance to enter the dungeon-like gate chambers to do the work.

Up to January, 1950, main drainage work was in charge of a main drainage crew. At that time the work was transferred to the district yards. The men formerly employed on this work were assigned to sewer cleaning. This arrangement is satisfactory as far as keeping the sump connections free is concerned, but not in regard to gate maintenance work.

If there is any solution to the problem, it is to organize a crew from present employees consisting of a foreman, four mechanics, and a chauffeur, who have the mechanical ability; but what is more important, the willingness to enter the locations where the work is to be done. Sufficient remuneration should be provided for these employees to compensate for the difficult and dangerous

working conditions if qualified and willing workers are to be obtained for this work. This is one of the most urgent needs of the Sewer Division.

3. *Sewer Cleaning and Grease Problem.*

Insufficient funds have been spent on sewer cleaning in Boston for the past 25 years or more. Surveys show that 25 per cent or more of the capacity of parts of the interceptor sewers, the cross-town relief sewer from Central street to Causeway street, many of the surface drain conduits (particularly Davenport Brook, which is now being cleaned) are occupied by sand and gravel that has settled out due to low velocities. In addition, much of the local sewer system north of Massachusetts avenue requires cleaning. In the market district and in the Park square area there are large amounts of grease in the sewers contributed by food-processing establishments and restaurants.

During the past 12 years, much effort has been given in an attempt to meet this problem with a sewer cleaning crew, now consisting of 15 men. Some progress has been made, but a very large amount of work remains to be done. The sewer cleaning equipment of the present sewer cleaning crew is adequate for the labor force now engaged in this work.

To attack the problem in the manner it deserves requires much additional manpower, equipment and proper supervision. One catch-basin cleaning machine, a truck and crew could be kept continuously busy cleaning sumps and grease from manholes, rather than intermittently as at present. Without question, sewer cleaning is the second most important maintenance problem confronting the Sewer Division.

4. *Union Park Street Pumping Station.*

The main electrical board is obsolete and should be replaced. The mechanical bar screen, now out of use, is obsolete and worn out, and should be replaced with a new bar screen and screening grinder. Preliminary plans for the bar screen have been completed.

The Sewer Division labor force has a quota of 31 laborers, 21 assigned to the six yards, 7 to Calf Pasture and Moon Island, and 3 vacancies; a quota of 30 sewer cleaners, 26 assigned to the six yards, 3 to Calf Pasture and Moon Island, and 1 vacancy; a quota of 33 chauffeur-laborers and teamsters, 24 assigned to the six

yards (25 vehicles, exclusive of 5 catch-basin cleaning machines, and 3 pickup trucks), 9 to Calf Pasture, Moon Island and office; a quota of 7 catch-basin machine operators assigned to yards (5 operate catch-basin cleaning machines, 2 power winches); a quota of 4 masons, 2 carpenters, 4 yardmen, 1 machinist assigned to the six yards — making a total of 89 men assigned to answering complaints, repairs to manholes and catch basins, repairing broken sewers, cleaning catch basins and sewers, and other related work. The number of men available is reduced by about 9, who because of actual physical conditions are on light duty, and 3 assigned to patrol service. The number of men available is small rather than large, and yet, in general, is satisfactory except as previously noted for sewer cleaning work.

Most any work connected with the maintenance of sewers is not only disagreeable, but also of a difficult, if not dangerous nature, and this factor should be taken into consideration when considering the efficiency of this class of work. Another thing to keep in mind is that sewer maintenance, and especially sewer cleaning work, is a job for young, vigorous men. As a guess, the average age of our men is 55, or over, fast approaching the age when they should be given lighter duties, and their places taken by younger men.

During the fiscal year 1950 there were built by contractors and day labor 6.66 miles of common sewers and surface drains throughout the city. After deducting 0.11 mile of sewers and surface drains, rebuilt or abandoned, the net increase for 1950 is 6.55 miles, which added to the existing 1,248.43 miles of common sewers and surface drains and 30.93 miles of intercepting sewers, makes a grand total of 1,285.91 miles of all sewers belonging to the City of Boston, and under the care of the Sewer Division on January 1, 1951.

There were 142 catch basins built or rebuilt and 11 abandoned or removed during the year, making a net gain of 131 catch basins and a grand total of 23,286 catch basins under the care of the Sewer Division on January 1, 1951.

Entrance fees to the amount of \$969.16 have been deposited with the City Collector for collection from estates upon which no sewer assessments were ever paid, in accordance with Ordinances of 1947, chapter 27, section 10.

Eight hundred and eighty permits have been issued, viz., 334 to district foremen and contractors and 546 to drainlayers for repairing or laying new house drains. Inspectors from this office have personally inspected the work done under these drainlayers' permits.

Two thousand eight hundred and forty complaints have been investigated, and inspectors have been instructed to report in writing in each case.

One thousand four hundred and sixty catch basin complaints were received.

Reported in writing on 2,873 municipal liens to the City Collector, in accordance with chapter 60, section 25, of the General Laws. Reported orally on about 2,680 requests for information on municipal liens.

Notices have been mailed to abutters in conformity with the Ordinances of 1925, chapter 27, section 8, apprising them of the construction of new sewers or repairs to old sewers.

Respectfully,

ROBERT P. SHEA,
Division Engineer.

**Summary of Sewer Construction for Twelve Months Ending
December 31, 1950.**

DISTRICTS.	Built by the City Either by Contract or Day Labor.	Built by Private Parties.	Total Lengths Built.	
	<i>Linear Feet.</i>	<i>Linear Feet.</i>	<i>Linear Feet.</i>	<i>Miles.</i>
City Proper.....	365.00	.....	365.00	0.0691
Roxbury.....	1,520.00	.....	1,520.00	0.2879
South Boston.....	None.	None.	None.	None.
East Boston.....	323.80	.....	323.80	0.0613
Charlestown.....	None.	None.	None.	None.
Brighton.....	1,293.20	.....	1,293.20	0.2449
West Roxbury.....	15,650.59	.....	15,650.59	2.9641
Dorchester.....	2,895.35	.....	2,895.35	0.5483
Hyde Park.....	9,160.99	3,938.00	13,098.99	2.4809
Totals.....	31,208.93	3,938.00	35,146.93	6.6565

**Summary of Sewer Construction for Five Years Previous to
January 1, 1951.**

	1946.	1947.	1948.	1949.	1950.
	<i>Linear Feet.</i>	<i>Linear Feet.</i>	<i>Linear Feet.</i>	<i>Linear Feet.</i>	<i>Linear Feet.</i>
Built by city by contract or day labor...	14,204.38	24,166.43	29,754.60	39,596.88	31,208.93
Built by private parties or other city departments.....	4,463.00	15,216.70	8,969.68	.....	3,938.00
Totals.....	18,667.38	39,383.13	38,724.28	39,596.88	35,146.93

Total Length of Sewers.

DISTRICTS.	Total Lengths Built During Twelve Months Ending December 31, 1950.	Lengths Removed or Abandoned During Twelve Months Ending December 31, 1950.	Additional Lengths for the Twelve Months Ending December 31, 1950.	
	<i>Linear Feet.</i>	<i>Linear Feet.</i>	<i>Linear Feet.</i>	<i>Miles.</i>
City Proper.....	365.00	365.00	.....	.....
Roxbury.....	1,520.00	.....	1,520.00	0.2879
South Boston.....	None.	None.	None.	None.
East Boston.....	323.80	.....	323.80	0.0613
Charlestown.....	None.	None.	None.	None.
Brighton.....	1,293.20	.....	1,293.20	0.2449
West Roxbury.....	15,650.59	.....	15,650.59	2.9641
Dorchester.....	2,895.35	22.00	2,873.35	0.5442
Hyde Park.....	13,098.99	178.84	12,920.15	2.4470
Totals.....	35,146.93	565.84	34,581.09	6.5494

	Miles.
Common sewers and surface drains built previous to January 1, 1950	1,248.43
Common sewers and surface drains built between January 1 and December 31, 1950	6.55
Total of above ending December 31, 1950	1,254.98
Total length of city intercepting sewers connecting with metropolitan sewers to December 31, 1950	*6.81
Total length of Boston main drainage intercepting sewers to December 31, 1950	*24.12
Grand total of common and intercepting sewers to December 31, 1950	1,285.91
Total mileage of streets containing sewerage works to January 1, 1951	699.50

* No additional lengths built during 1950.

Catch Basins in Charge of Sewer Division.

DISTRICTS.	CATCH BASINS FOR TWELVE MONTHS ENDING DECEMBER 31, 1950.			TOTAL FOR WHOLE CITY IN CHARGE OF SEWER DIVISION.	
	Number Built or Rebuilt.	Number Abandoned or Removed.	Net Increase.	Previous Report to January 1, 1950.	Grand Total to January 1, 1950.
City Proper.....	0	0	0	3,637	3,637
Roxbury.....	6	5	1	3,379	3,380
South Boston.....	1	0	1	1,461	1,462
East Boston.....	5	0	5	1,107	1,112
Charlestown.....	0	0	0	843	843
Brighton.....	18	0	18	2,035	2,053
West Roxbury.....	28	0	28	4,084	4,112
Dorchester.....	27	6	21	5,543	5,564
Hyde Park.....	57	0	57	1,066	1,123
Totals.....	142	11	131	23,155	23,286

CALF PASTURE PUMPING STATION.

Résumé for Year 1950.

Sewage Record.

MONTH.	Total Gallons Pumped.	Average Gallons Pumped Daily.
January.....	2,981,111,000	96,164,548
February.....	2,885,857,000	103,066,321
March.....	3,205,837,000	103,414,096
April.....	2,567,686,000	85,589,533
May.....	2,915,920,000	94,061,935
June.....	2,944,972,000	98,165,733
July.....	3,144,609,000	101,439,000
August.....	3,090,211,000	99,716,451
September.....	2,871,336,000	95,711,200
October.....	2,958,423,000	95,433,000
November.....	3,212,301,000	107,076,700
December.....	3,218,960,000	103,837,420
Totals.....	35,997,223,000	1,183,675,937
Average.....	.....	98,622,529

Fuel Oil Record.

MONTH.	Gallons Received.	Cost.
January.....	24,365	\$1,264 69
February.....	24,348	1,263 81
March.....	28,272	1,380 93
April.....	20,288	1,024 10
May.....	20,205	1,048 78
June.....	20,242	1,050 69
July.....	16,155	877 03
August.....	24,307	1,319 56
September.....	20,242	1,098 93
October.....	15,437	832 11
November.....	24,196	1,304 25
December.....	23,796	1,282 74
Totals.....	261,853	\$13,747 62

Electric Current Supplied, Edison Company.

MONTH.	Kilowatt- Hours.	Cost.
January.....	514,780	\$6,066 25
February.....	519,060	6,394 54
March.....	481,400	6,107 84
April.....	528,900	6,464 02
May.....	554,000	6,597 03
June.....	505,520	6,021 99
July.....	550,000	6,568 10
August.....	464,000	5,611 15
September.....	558,000	6,356 06
October.....	478,000	5,853 75
November.....	514,000	6,219 16
December.....	627,000	7,203 75
Totals.....	6,245,260	\$75,463 64

	Cost.
Labor	\$130,347 98
Edison power	75,463 64
Fuel oil	13,747 62
Packing	57 03
Supplies and miscellaneous	4,387 43
Totals	\$224,003 70
Cost per million gallons pumped	\$6 22

Sewer Division — Maintenance Expenditures, Details, 1950—Improved Sewer.

ACCOUNTS.	Totals.	Labor.	Repairs.	Motor Vehicles.	Taxes.	Contractors.	Light, Heat, and Power.	Materials.	Tools, and Equipment.	Miscellaneous.
Pumping Station, Calf Pasture.....	\$194,820 03	\$99,004 32	\$9,854 70	\$93 90	.....	\$745 29	\$89,365 92	\$1,708 70	.....	\$47 20
Pumping Station, Union Park Street.....	14,981 98	12,635 83	259 38	50 25	.....	.....	1,735 90	219 02	.....	21 60
Pumping Station, Summer Street.....	3,536 56	1,828 02	.....	50 25	.....	.....	1,658 29	.....	.....	.....
Pumping Station, Moon Island.....	39,678 87	37,660 88	802 59	.....	\$497 20	.....	562 49	110 11	.....	45 60
Main and intercepting sewers.....	11,908 56	10,237 30	28 63	612 00	.....	.....	151 90	857 13	.....	21 60
Mt. Vernon street, Calf Pasture Pumping Station, cleaning deposit sewer.....	3,012 37	.....	.....	.....	.....	3,012 37	.....	.....	.....	.....
Calf Pasture Pumping Station, repair fifth hoist.....	426 00	.....	.....	.....	.....	426 00	.....	.....	.....	.....
Calf Pasture Pumping Station, Dorchester, demolition steam engine and pump.....	21 50	.....	.....	.....	.....	.....	.....	.....	.....	21 50
Moon Island, new hot water boiler installed	3,716 47	.....	.....	.....	.....	3,716 47	.....	.....	.....	.....
Totals.....	\$272,102 34	\$161,426 35	\$4,945 30	\$806 40	\$497 20	\$7,900 13	\$93,474 50	\$2,894 96	.....	\$157 50

Sewer Division — Maintenance Expenditures, Details, 1950 — Outside Improved Sewer.

ACCOUNTS.	Totals.	Labor.	Repairs.	Motor Vehicles.	Taxes.	Contractors.	Light, Heat, and Power.	Materials.	Tools, and Equipment.	Miscellaneous.
Automobiles.....	\$3,208 04	.....	\$2,033 79	.....	.....	.....	.....	\$114 25	.....	Storage..... \$60 00
Cleaning catch basins..	107,209 62	\$58,931 61	.....	\$15,236 0	.....	\$32,087 51	.....	.....	.....	Miscellaneous..... 54 50
Cleaning sewers.....	82,119 57	71,678 54	.....	10,379 75	.....	.....	.....	61 28	.....	.....
Fuel and oil.....	683 30	.....	.....	.....	.....	.....	\$683 30	.....	.....	.....
Hardware and tools....	4,351 78	.....	760 66	.....	.....	.....	.....	3,591 12	.....	.....
House connections.....	15,376 40	15,302 63	.....	57 00	.....	.....	.....	16 77	.....	.....
Maintenance, Stony Brook.....	2,689 22	2,117 77	107 98	458 75	.....	.....	.....	4 72	.....	.....
Office expense.....	7,949 09	1,211 07	127 12	1,715 62	.....	.....	.....	3 06	\$127 39	Printing..... 401 15 Supplies..... 3,407 78 Postage..... 371 92 Miscellaneous..... 523 98
Office salaries.....	51,356 11	51,356 11	.....	.....	.....	.....	.....	.....	.....	.....
Stock.....	4,582 35	.....	.....	.....	.....	.....	.....	4,582 35	.....	.....
Testing laboratory.....	521 34	.....	65 05	.....	.....	.....	120 25	303 35	.....	Miscellaneous..... 32 69
Yards.....	70,599 47	61,654 44	13 00	8,510 03	.....	.....	180 81	148 77	.....	Miscellaneous..... 92 40
Commonwealth avenue (south side), between Commonwealth avenue and Boston & Albany Railroad....	1,783 86	.....	.....	.....	.....	1,760 36	.....	.....	.....	Advertising..... 23 50
Repair, clean, and sand streets.....	532 28	.....	293 65	42 00	.....	.....	.....	.....	.....	Sanding..... 196 63
Repair department buildings.....	501 50	475 55	.....	13 50	.....	.....	.....	102 45	.....	.....

Repair catch basins, South Boston.....	2,907 71	2,025 03	.....	194 00	.....	.....	688 68
Repair catch basins, East Boston.....	567 56	448 06	.....	25 50	.....	.....	94 00
Repair catch basins, Charlestown.....	1,613 01	1,152 72	.....	146 50	.....	.....	313 79
Repair catch basins, Brighton.....	3,338 70	2,045 33	.....	445 50	775 00	.....	72 87
Repair catch basins, West Roxbury.....	5,358 30	2,928 37	.....	648 50	.....	.....	1,781 43
Repair catch basins, Dorchester.....	7,960 28	3,708 56	.....	779 50	300 00	.....	3,172 22
Repair catch basins, Hyde Park.....	1,678 50	719 04	.....	141 75	.....	.....	817 71
Repair catch basins, Roxbury.....	8,664 12	6,728 29	.....	618 00	.....	.....	1,317 83
Repair catch basins, City Proper.....	8,003 32	5,956 37	.....	575 50	.....	.....	1,471 45
Repair sewers, South Boston.....	961 93	523 98	.....	61 00	.....	.....	376 95
Repair sewers, East Boston.....	356 32	204 75	.....	65 00	.....	.....	86 57
Repair sewers, Charles- town.....	488 21	336 27	.....	42 00	.....	.....	109 97
Repair sewers, BRIGHTON.....	3,681 12	2,696 96	.....	915 00	.....	.....	69 16
Repair sewers, West Roxbury.....	2,095 89	1,362 39	.....	251 00	.....	.....	482 50

Total of outside improved sewerage.....	\$512,797 70	\$376,051 98	\$4,405 50	\$45,058 17	.....	\$52,488 46	\$1,363 30	\$23,372 26	\$127 39	\$9,927 61
Total of improved sewerage.....	272,102 34	161,426 35	4,945 30	806 40	497 20	7,900 13	93,474 50	2,894 96	.....	157 50
1950, total gross expenditures....	\$784,900 04	\$537,481 33	\$0,350 80	\$45,861 57	\$497 20	\$60,388 59	\$94,837 80	\$26,267 22	\$127 39	\$10,085 14
CREDITS.										
Trucks etc., used on maintenance....	\$42,566 50	.....	.....	42,566 50	.....	.....	.....	3,461 88	.....	.....
Maintenance stock used on maintenance....	3,461 88	.....	.....	.....	.....	.....	.....	.....	.....	.....
Construction stock used on maintenance....	11,432 71	.....	.....	.....	.....	.....	.....	11,432 71	.....	.....
Total credits.....	57,461 09	.....	.....	42,566 50	.....	.....	.....	14,894 59	.....	.....
1950, total net expenditures....	\$727,438 95	\$537,481 33	\$0,350 80	\$3,298 07	\$497 20	\$60,388 59	\$94,837 80	\$11,372 63	\$127 39	\$10,085 14

Sewerage Works Contracts, from January 1, 1950, to December 31, 1950.

LOCATION.	Begin.	Finished.	Built by.	Length in feet.	Character.	Amount Expended in 1950.
EAST BOSTON.						
Decatur Street overflow in private land, from Border street to 260 feet northerly.	.....	.....	A. Cibotti and C. Andreassi	No const.	Preliminary engineering.....	\$112 49
Horace street, from Moore street to Har- mony street.	April 11, 1950	June 16, 1950	N. Bevilacqua & Son.....	323 80	10" pipe, sewer..... 5 catch basins, 2 manholes.	8,517 98
CHARLESTOWN.						
Roland Street overflow in private land, between Roland street and 308 feet southerly.	Aug. 29, 1949	Oct. 11, 1949	Joseph Botti & Son.....	No const.	Final payment.....	401 48
BRIGHTON.						
Guest street, from Market street to Life street, and Life street, from Guest street to North Beacon street.	April 21, 1950	May 23, 1950	Walter Reed Corporation...	167 00	10" catch-basin drain..... 2 manholes, 5 drop inlets, 10 catch basins.	4,946 55
Faneuil street and Commonwealth avenue.	Sept. 14, 1949	July 7, 1950	R. A. Bucciella & Sons, Inc.	384 30 123 00 200 90	12" pipe, surface drain..... 10" catch-basin drain, 24" pipe, surface drain, 3 manholes, 5 catch-basins.	6,968 65
Reedsdale street, Kilsyth road, and Union street, Brighton; Spring Park avenue, and Washington street, West Rox- bury; Pond street, Dorchester; Homer street and Saratoga street, East Boston.	Nov. 18, 1946	Dec. 20, 1946	Central Construction Co....	No const.	Final payment.....	181 35
Mt. Vernon street and Platt road.	June 8, 1949	Oct. 6, 1949	James D'Amico, Inc.....	No const.	Final payment.....	671 29
Minor sewerage works in West Roxbury and Brighton.	Aug. 4, 1949	Oct. 26, 1949	Angelo Grande.....	No const.	Final payment.....	445 14
Commonwealth avenue, Brighton, and Canterbury Brook, West Roxbury.	Aug. 14, 1950	Sept. 30, 1950	Gaetano P. DeLuca.....	98 00	Repair culvert, Commonwealth avenue. Concrete wall on Canterbury Branch of Stony Brook.	5,802 53

Dec.	15, 1949	April	21, 1950	Baker & Co.....	3.39 2.80	18" pipe, surface drain. 12" pipe, surface drain. 6 catch basins. (Test of construction reported in 1949.)	11,750 11
Jan.	5, 1950	April	21, 1950	Joseph Capone & Son.....	1,031.45 1,034.64 39.00	10" pipe, sewer..... 12" and 10" pipe, surface drain. 10" catch-basin drain. 11 manholes. 2 catch basins.	13,469 29
Jan.	10, 1950	April	29, 1950	James D'Amico, Inc.....	263.60 62.00	10" pipe, surface drain..... 10" catch-basin drain. 1 manhole. 3 catch basins.	5,270 17
March	2, 1950	June	15, 1950	Bagarella Construction Com- pany, Inc.	1,076.70 862.96	10" pipe, sewer..... 10" pipe, surface drain. 9 manholes.	10,139 92
Sept.	14, 1949	July	7, 1950	Andrew P. Keegan.....	517.48 2,939.43 517.23 1,241.26 1,123.30 557.79	10" and 12" pipe, sewer..... 10" pipe, sewer. 30", 27", 12" pipe, surface drain. 15", 12", 10" pipe, surface drain. 20", 18", 15" pipe, surface drain. 12" and 10" pipe, surface drain. 22 manholes.	57,368 72
May	31, 1950	July	6, 1950	Joseph Capone & Son Com- pany.	987.46 23.00 106.00	10" and 12" pipe, surface drain.... 10" pipe, sewer. 10" catch-basin drain. 6 manholes. 8 catch basins.	9,610 73
July	10, 1950	Oct.	15, 1950	Domenic Aiello, Jr.....	151.35 896.66 92.00	10" pipe, sewer..... 10" pipe, surface drain. 10" catch-basin drain. 8 manholes. 8 catch basins.	11,886 37
Oct.	3, 1949	Dec.	14, 1949	Roslindale Contracting Company.	.....	Final payment.....	3,255 23
May	17, 1949	Aug.	31, 1949	Baker & Co., Inc.....	.....	Final payment.....	1,060 16

Sewerage Works Contracts, from January 1, 1950, to December 31, 1950. — Continued.

LOCATION.	Begun.	Finished.	Built by.	Length in Feet.	Character.	Amount Expended in 1950.
Shaw street, Addington road, and Gould street.	July 6, 1950	Aug. 7, 1950	J. J. Struzziery Company, Inc.	523.35 407.70	10" pipe, sewer. 10" pipe, surface drain. 4 manholes.	\$6,970.93
Cowing street, Harvey street, and Temple Street Brook, West Roxbury, and Carola street, Brighton.	Oct. 30, 1950	Not finished.	Domenie Aiello, Jr.	493.13 130.00 130.00 9.00	30" pipe, surface drain. 10" pipe, surface drain. 10" pipe, sewer. 10" catch-basin drain. 5 manholes. 1 catch basin.	8,626.37
Latin road and outlet in private land to Churchhill road and Lasell street and Lyall street, West Roxbury.	Nov. 17, 1950	Not finished.	Honore DiTullo.	350.00 597.00 255.00 661.00	10" pipe, sewer. 10" pipe, surface drain. 15" pipe, surface drain. 10" catch-basin drain. 11 manholes. 4 catch basins.	3,187.13
DORCHESTER.						
Barry park, Bismarck street, Loma road, Edna road, Dorchester, and Reservoir street, Hyde Park.	March 17, 1950	May 13, 1950	R. A. Buccella & Sons, Inc.	618.66 200.00	10" pipe, sewer. 12" pipe, surface drain. 5 manholes. 4 catch basins.	9,285.79
Old Colony Parkway, from Mt. Vernon street to 1,733 feet southerly.	March 15, 1950	June 12, 1950	Baker & Co., Inc.	1,648.22	12" pipe, sewer. 9 manholes.	28,422.95
Sewage Treatment Plant.	Nov. 2, 1945	Sept. 30, 1949	Charles A. Maguire Associates.	.....	Engineering.	184.11
Sewage Treatment Plant, furnish and place gravel at Calf Pasture Pumping Station.	March 27, 1950	March 28, 1950	Carriere Construction Company.	.....	2,171 tons of bank gravel placed.	2,920.51
Calf Pasture Pumping Station, new heating system and other mechanical work.	Oct. 2, 1950	Not finished.	Beacon Piping Company.	.....	60 per cent completed on heating system.	16,312.67
Old Colony Parkway.	July 10, 1950	Aug. 1, 1950	Frank DiCenso & Co.	161.21	12" pipe, sewer.	6,652.76
Gallivan Boulevard, from 170 feet northeast of Clover street to 108 feet southeasterly and northeasterly.	Sept. 5, 1950	Sept. 28, 1950	Joseph Botte & Son.	165.94	10" pipe, sewer. 2 manholes.	3,624.91
Moon Island, new hot water boiler installation.	Oct. 3, 1950	Dec. 26, 1950	J. McCusker Company.	.....	Engineering and advertising.	443.52

Old Colony Parkway, from 1,070 feet south of Mt. Vernon street to 100 feet southerly. HYDE PARK.	Dec. 11, 1950	Dec. 27, 1950	Frank DiCenso Company...	97.65	12" pipe, sewer.....	\$863 90
Child street, Linwood street, Valencia road, Avila road, Hyde Park, and Wenlock road, Dorechester.	Nov. 28, 1949	Jan. 10, 1950	Susi & DeSantis Company, Inc.	60.50 2.90 427.00	12" pipe, sewer..... 18" pipe, surface drain. 12" pipe, surface drain. 9 catch basins.	15,274 46
Garfield avenue, Loring street, Glenwood avenue, Tyler street, Washington street, New street, Woodglan road, and Chittick road.	Aug. 4, 1949	Oct. 8, 1949	Baker & Co., Inc.....	.....	Construction in 1949 — final payments only.	24,243 60
Riverside square and Radford place, Hyde Park, and Hebron street, Dorechester.	Nov. 29, 1949	March 10, 1950	Baker & Co., Inc.....	493.45 308.48 184.62	10" pipe, sewer..... 10" pipe, surface drain. 12" pipe, surface drain. 4 manholes. 3 catch basins.	20,741 35
Skyline road and in private land, from Williams avenue to Skyline road.	Nov. 10, 1949	Dec. 23, 1949	Angelo Grande.....	.....	Final payment..... Engineering and iron frames and covers.	5,008 13
Bradlee street, from Tacoma street to Safford street, Hyde Park; Safford street, from Bradlee street to Melba Way, Hyde Park, and Melba Way, from Safford street to 185 feet northerly.	June 20, 1949	Aug. 4, 1949	Angelo Grande.....	.....	Final payment..... 2 lamp holes.	648 65
Millstone road, Colechester street, and Stanbro street.	June 22, 1949	Aug. 27, 1949	Pacella Brothers, Inc.....	.....	Final payment and engineering.....	1,843 56
Andrea road, Hyde Park.	May 9, 1950	May 17, 1950	Joseph Capone & Son Company,	172.85	10" pipe, sewer..... 1 manhole. 1 catch basin. 1 lamp hole.	2,276 85
Orehard street, Hyde Park; Charles road, Dorechester, and minor sewerage works in Dorechester and Hyde Park.	Dec. 6, 1948	Nov. 18, 1949	R. A. Buccella & Sons Company.	21.97 sq. yds.	Artificial stone sidewalk.....	63 96
Manila avenue, Vaughan street, Nelson street, Cono road, and Imbaro road, and Norton street.	Aug. 7, 1950	Oct. 28, 1950	J. J. Struzziery Company, Inc.	1,792.50 1,778.80 178.84	15" pipe, surface drain..... 12" pipe, surface drain. 10" sewer rebuilt. 20 catch basins.	29,361 21
Turtle Pond Parkway, from Kiver street to Berwick street.	Oct. 4, 1948	March 21, 1949	Baker & Co., Inc.....	No const.	Engineering.....	763 59
Truman Highway and private land and Washington Street Extension and private land.	Oct. 11, 1950	Dec. 2, 1950	D'Allesandro & Crognale, Inc.	1,287.65 2,152.73	15" pipe, sewer..... 12" pipe, sewer. 17 manholes. 8 manholes regulated by Baker & Co.	4,552 41

CONSTRUCTION REPORT, 1950.
Sewerage Works, 1950.

ACCOUNTS.	Totals.	Labor.	Trucks, Compressors, Pumps, etc.	Tools and Materials.	Contractors.	Sundries.
Office and engineers' salaries.....	\$110,247 14	\$110,247 14				
Office and engineers' expenses.....	11,389 21		\$9,959 74	\$1,213 57		\$185 90
Miscellaneous.....	723 47	221 45		15 02	\$432 00	55 00
Land-takings.....	500 00					500 00
New manholes, entire city.....	873 43	231 01	70 00	566 42		
New catch basins, South Boston.....	1,025 75	232 74		128 33	664 68	
New catch basins, East Boston.....						
New catch basins, Charlestown.....						
New catch basins, Brighton.....	619 00		44 00		575 00	
New catch basins, West Roxbury.....	61 51			64 51		
New catch basins, Dorchester.....	863 38	79 77		118 11	665 50	
New catch basins, Hyde Park.....	2,163 76	1,188 20	215 00	306 31	454 25	
New catch basins, Roxbury.....	2,967 10	202 51		794 59	1,970 00	
New catch basins, City Proper.....	477 24	181 46	23 50	272 28		
Repair streets.....	89 10				89 10	
Release sewers.....						
Stock.....	6,473 47	278 87		6,194 60		

CONSTRUCTION REPORT, 1950. — Concluded.
Sewerage Works, 1950. — Concluded.

ACCOUNTS.	Totals.	Labor.	Trucks, Compressors, Pumps, etc.	Tools and Materials.	Contractors.	Sundries.
Testing laboratory.....	\$5,649 90	\$5,649 90				
Holidays, vacations, sick leave, etc.....	14,912 04	14,912 04				
Unadvertised jobs.....	3,248 21	673 27	\$176 00	\$1,542 22	\$856 72	
Mechanics Iron Foundry Company.....	25,441 04	1,445 93	.....	.....	23,995 11	
Columbia road (Chap. 90), furnishing iron.....	2,706 86	.....	.....	2,706 86		
Total, miscellaneous.....	\$190,434 61	\$135,544 29	\$10,494 24	\$13,952 82	\$29,702 36	\$740 90
Total, sewers built.....	398,473 93	59,674 20	.....	15,532 22	320,926 60	2,340 91
Total, gross expenditures.....	\$588,908 54	\$195,218 49	\$10,194 24	\$29,485 04	\$350,628 96	\$3,081 81
CREDITS.						
Maintenance stock used on construction.....	\$339 44	.....	.....	339 44		
Construction stock used on construction.....	20,158 41	.....	.....	20,158 41		
Trucks, cars, etc, used on construction.....	534 50	.....	.....	.....
Total credits.....	\$21,032 35	.....	534 50	.....	
Total expenditures, 1950.....	\$567,876 19	\$195,218 49	\$9,959 74	\$8,987 19	\$350,628 96	\$3,081 81

APPENDIX E.

REPORT OF THE DIVISION ENGINEER OF
THE WATER DIVISION.

BOSTON, January 2, 1951.

To the Commissioner of Public Works.

DEAR SIR:

I respectfully submit the following report of the activities of the Water Division, operations and expenditures for the fiscal year ending December 31, 1950.

The shortage of critical materials having been lessened, and new meters made available, the work of laying and relaying water mains and the replacement of obsolete meters, etc., was resumed.

A total of 21,229 linear feet of pipe were either laid or relaid, varying in sizes from 4 inches to 16 inches, inclusive, as follows:

DISTRICT.	LAID. Linear Feet.	RELAID. Linear Feet.
Roxbury	0	1,760.5
East Boston	2,273.5	2,359.5
City Proper	0	0
South Boston	0	0
Dorchester	730	5,328
Brighton	2,856.5	0
West Roxbury	4,999	3,351.5
Hyde Park	427	0
Charlestown	0	0
Total	8,429.5	12,799.5

The particular streets in which the above work was performed are shown on the accompanying tables.

The National Board of Fire Underwriters made a survey during the year of the distribution system, which included the inspection of hydrants and gates, and conducted flow tests throughout the city, showing the capacity of the mains as to their adequacy in the event of a fire.

The department was forced to repair approximately 60 main pipe leaks, the most important of which was a break in the 30-inch high service line at Broadway and

Harrison avenue; a 20-inch high service line in Boylston street, at Clarendon, and a 24-inch pipe line in Washington street, between State street and Cornhill.

During the year a Pitometer Survey was made of the distribution system in the Jamaica Plain and West Roxbury districts on the high service and extra high service.

Considerable work on the distribution mains in the Charlestown system was occasioned by the building of the foundations of the Mystic River Bridge and its approaches.

During the year the Metropolitan District Commission completed the construction of the rock tunnel and made connections to the distribution system of the Public Works Department, Water Division, resulting in an increased pressure in the high and low service systems. The increased pressure in the low service system was occasioned by the discontinuance of the Chestnut Hill Reservoir Pumping Station.

DISTRIBUTION BRANCH.

Due to the increased volume of work caused by applications for service pipes, etc., the department has engaged the services of contractors during the year.

The regular work of this branch, consisting of installation of new services and fire pipes, repairing of leaks, caring for complaints, shutting off and letting on water, freeing of stoppages in pipes, etc., was performed in such a manner and at such periods as to cause minimum delay and inconvenience to applicants for water, water takers, and the general public.

The machine shop and plumbing shop were forced to handle all the drilling and connecting of services in addition to the regular work carried on in these shops, such as the machining and assembling of gates, valves, and hydrants, and the department assisted the other branches of the Public Works Department in performing special jobs.

The replacement of old style hydrants necessitated this department entering into a contract for machining 6-inch, 8-inch, and 12-inch valves and post hydrants.

BUSINESS OFFICE.

In order to enforce the payment of outstanding water bills, customers in arrears are notified that the flow of water will be reduced, but yet enough water is left on

the premises to provide a minimum for health and sanitary requirements. As a result, the Water Division ended the year 1950 with a surplus of \$320,072.61, this surplus being due mainly to the collection of bills due and payable.

Main pipe petitions received	28
Domestic service applications	597
Fire pipe applications	71
Special meter tests	89
Hydrant permits issued	18
Repair deposits received	144
Miscellaneous deposits	42

APPROPRIATIONS, EXPENDITURES, AND REVENUE.

Budget appropriation	\$2,540,825 00
Amount expended	2,349,060 88
Unexpended balance	\$191,764 12
Amount of money collected during the year	\$4,714,700 11
Amount expended from all sources	4,394,62 50
Balance	\$320,072 61

The metropolitan assessment for 1950 amounted to \$1,661,063.28, at the rate of \$40 per million gallons, a decrease of \$58,843.48 over the assessment for 1949.

Total amount billed in 1950	\$4,762,625 10
Total amount collected for 1950 bills, as of December 31, 1950	\$3,803,267 75
Total amount abated for 1950 bills, as of December 31, 1950	\$28,552 98
Total amount collected in 1950, on bills rendered prior to 1950	\$812,996 50

This department contacts the water consumers very frequently throughout the year, and the conduct of the office has been such that I believe a spirit of good will between the customers and the employees has been brought about which is beneficial to the consumers and the city.

The issuance of statements of outstanding water bills to the consumers before placing of liens on premises has been continued. The appreciation of the customers is shown by the fact that the number of liens placed on the premises this year has been reduced.

Respectfully submitted,

D. M. SULLIVAN,
Division Engineer.

Table No. 1. Statement of Work Done During 1950.

MAKE.	Applied.	Discontinued.	METERS CHANGED.		Tested in Shop.	Repaired in Service.	Repaired in Shop.	Resets.	Salvaged.
			Out.	In.					
Hersey Disc.....	576	491	5,926	9,181	15,107	572	910	601	472
Hersey Detector.....	1	1	13	11	24	40	16		
Hersey Compound....	40		6	34	40	29		1	
Hersey Rotary.....									
Worthington Disc.....	31	432			432	1			463
Watch Dog.....	55	166	2,637	426	3,063	155	682	28	2,487
King.....	23	411			411	3			431
Federal.....	4	33			33				37
American.....	1	153			153				152
Lambert.....		12			12	1			13
Crown.....		7			7	1			7
Trident.....	2	1	11		11	1			9
Arctic.....				2	2	2			
Nash.....	1	12			12				13
Keystone.....		1			1				1
Sparling.....	2							1	
Totals.....	675	719	9,654	9,654	19,308	805	1,608	631	4,085

Table No. 2. Meters in Service December 31, 1950.

MAKE.	DIAMETER IN INCHES.											Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	6	8	10	12	
Hersey Disc.....	64,178	3,698	2,214	1,239	784	141	143	37	1	....	....	72,435
Hersey Detector.....	.....	.....	.....	.....	.....	7	50	65	34	23	9	188
Hersey Compound.....	.....	.....	.....	.....	5	148	76	29	.....	.....	.....	258
Hersey Rotary.....	43	53	26	29	.....	.....	.....	.....	.....	.....	.....	151
Worthington Disc.....	2,615	21	22	23	34	7	.....	.....	.....	.....	.....	2,722
Watch Dog.....	19,108	828	717	732	467	406	.....	.....	.....	.....	.....	22,258
American.....	152	56	.....	.....	.....	.....	.....	.....	.....	.....	.....	208
King.....	461	86	.....	1	19	.....	.....	.....	.....	.....	.....	567
Federal.....	152	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	152
Crown.....	138	271	11	36	57	15	.....	.....	.....	.....	.....	528
Nash.....	51	28	17	4	.....	.....	.....	.....	.....	.....	.....	100
Lambert.....	35	7	12	.....	.....	.....	.....	.....	.....	.....	.....	54
Arctic.....	1	.....	.....	.....	19	21	17	10	.....	.....	.....	68
Keystone.....	13	5	1	.....	.....	.....	.....	.....	.....	.....	.....	19
Empire.....	25	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	27
Trident.....	25	2	2	11	11	19	1	1	1	1	....	74
Sparling.....	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	3
Totals.....	86,997	5,055	3,024	2,075	1,396	764	287	145	36	24	9	99,812

Table No. 3. Meters in Shop December 31, 1950.

MAKE.	DIAMETER IN INCHES.								Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	6	
NEW.									
Hersey Disc.....	1,310	1,440	157	6	50	.....	.....	.....	2,963
Hersey Compound H. C. T.....	.....	.....	.....	.....	.....	10	4	.....	14
Hersey Detector.....	.....	.....	.....	.....	.....	.....	4	.....	4
Totals.....	1,310	1,440	157	6	50	10	8	.....	2,981
OLD.									
Hersey Disc.....	62	12	10	11	18	3	2	1	119
Hersey Detector.....	.....	.....	.....	.....	.....	.....	6	.....	6
Watch Dog.....	58	4	.....	5	7	1	3	.....	78
Trident Disc.....	.....	.....	.....	.....	.....	3	.....	.....	3
Totals.....	120	16	10	16	25	7	11	1	206

Table No. 4. Meters Repaired in Shop in 1950.

MAKE.	DIAMETER IN INCHES.									Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	6	8	
Hersey Disc.....	748	27	32	50	36	10	4	3	....	910
Hersey Detector.....	.....	.....	.....	.....	.....	.....	8	6	2	16
Watch Dog.....	445	40	40	86	42	21	8	.....	.....	682
Totals.....	1,193	67	72	136	78	31	20	9	2	1,608

Table No. 5. Meters Repaired and Rebuilt at Factory in 1950.

MAKE.	DIAMETER IN INCHES.			Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	
Hersey Disc.....	7,258	484	203	7,945

Table No. 5A. Meters Purchased New in 1950.

MAKE.	DIAMETER IN INCHES.								Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	6	
Hersey Disc.....	2,000	.....	50	25	15	.....	.....	.....	2,090
Hersey Compound.....	.....	.....	.....	.....	.....	37	20	3	60
Hersey Detector.....	.....	.....	.....	.....	.....	.....	2	1	3
Totals.....	2,000	.....	50	25	15	37	22	4	2,153

Table No. 6. Meters Reset in 1950.

MAKE.	DIAMETER IN INCHES.							Occupied.	Connection Pieces.	Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	4	6			
Hersey Disc.....	548	40	8	2	2	1	....	39	562	601
Hersey Compound.....	.....	.....	.....	.....	.....	1	.....	.....	1	1
Watch Dog.....	18	2	.....	6	1	1	.....	6	22	28
Sparling.....	.....	.....	.....	.....	.....	.....	1	.....	1	1
Totals.....	566	42	8	8	3	3	1	45	586	631

Table No. 7A. Meters Changed in 1950. Meters Taken Out.

MAKE.	DIAMETER IN INCHES.									Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	1 $\frac{1}{2}$	2	3	4	6	8	
Hersey Disc.....	5,264	370	148	74	41	15	5	3	....	5,920
Hersey Detector.....	.....	.....	.....	.....	.....	1	6	4	2	13
Hersey Compound.....	.....	.....	.....	.....	.....	4	2	.....	.....	6
Worthington Disc.....	429	.....	.....	3	.....	.....	.....	.....	.....	432
Watch Dog.....	2,288	145	99	50	35	19	3	.....	.....	2,639
American.....	120	33	.....	.....	.....	.....	.....	.....	.....	153
King.....	393	11	2	3	2	.....	.....	.....	.....	411
Federal.....	33	.....	.....	.....	.....	.....	.....	.....	.....	33
Crown.....	1	1	1	1	1	2	1	.....	.....	8
Nash.....	11	.....	1	.....	1	.....	.....	.....	.....	13
Lambert.....	1	4	7	.....	1	.....	.....	.....	.....	13
Keystone.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1
Trident.....	9	.....	.....	.....	.....	.....	2	.....	.....	11
Arctic.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Totals.....	8,549	565	258	132	81	41	19	7	2	9,654

Table No. 7B. Meters Changed in 1950. Meters Put In.

MAKE.	DIAMETER IN INCHES.									Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	1 $\frac{1}{2}$	2	3	4	6	8	
Hersey Disc.....	8,149	628	264	83	56	....	1	.....	.....	9,181
Hersey Detector.....	.....	.....	.....	.....	.....	.....	4	5	2	11
Hersey Compound.....	.....	.....	.....	.....	.....	20	13	1	.....	34
Watch Dog.....	303	16	9	55	23	19	1	.....	.....	426
Arctic.....	.....	.....	.....	.....	1	1	.....	.....	.....	2
Totals.....	8,452	644	273	138	80	40	19	6	2	9,654

Table No. 8. Meters Repaired in Service in 1950.

MAKE.	Defaced and Broken Clocks.	Spindle Leaks.	Coupling Leaks.	New Trains.	Broken Gears.	Examinations.	Repaired Trains.	Total.
Hersey Disc.....	49	352	114	9	3	43	2	572
Hersey Detector.....	25	2	.....	10	1	2	.....	40
Hersey Compound.....	14	5	.....	6	.....	4	.....	29
Watch Dog.....	42	74	14	3	9	13	.....	155
Worthington Disc.....	.....	1	.....	.....	.....	.....	.....	1
King.....	.....	3	.....	.....	.....	.....	.....	3
Crown.....	.....	1	.....	.....	.....	.....	.....	1
Arctic.....	1	.....	.....	.....	.....	1	.....	2
Lambert.....	.....	1	.....	.....	.....	.....	.....	1
Trident.....	1	.....	.....	.....	.....	.....	.....	1
Totals.....	132	439	128	28	13	63	2	805

Table No. 9. Meters Applied in 1950.

MAKE.	DIAMETER IN INCHES.								Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	6	
Hersey Disc.....	465	11	11	29	52	3	2	3	576
Hersey Compound.....	.....	.....	.....	.....	.....	17	20	3	40
Watch Dog.....	14	.....	.....	24	11	6	.....	.....	55
Trident.....	.....	.....	.....	.....	.....	1	1	.....	2
Sparling.....	.....	.....	.....	.....	.....	.....	.....	2	2
Totals.....	479	11	11	53	63	27	23	8	675

Meters applied on new services..... 656

Meters applied on old services..... 19

Total..... 675

Table No. 10. Meters Discontinued in 1950.

MAKE.	DIAMETER IN INCHES.							Permanently Discontinued.	Vacancies.	Connection Pieces.	Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4				
Hersey Disc.....	393	42	28	14	9	4	1	169	53	269	491
Hersey Detector.....						1		1			1
Watch Dog.....	136	6	7	8	6	2	1	48	13	105	166
Worthington Disc.....	31							3	1	27	31
Federal.....	4									4	4
Trident.....						1		1			1
King.....	23							1	2	20	23
Nash.....				1				1			1
American.....		1						1			1
Totals.....	587	49	35	23	15	8	2	225	69	425	719

Table No. 11. Causes of Meter Changes for the Year 1950.

MAKE.	Department Test.	Do Not Register.	No Force.	Enlarged Meter.	Coupling Leak.	Clock Broken.	Spindle Leak.	Set Backwards.	Special Test.	Frost.	Noisy.	Total.
Hersey Disc.....	263	4,174	64	102	673	263	202	51	68	28	56	5,944
Hersey Detector.....	1	7										8
Watch Dog.....	44	2,177	13	10	251	40	55	14	15	4	8	2,631
Worthington Disc...	3	342	2	3	41	16	10	1		1	1	420
King.....	8	339		1	44	6	17	1	3			419
Nash.....		10			2	1						13
Lambert.....	1	9			3							13
Crown.....	2	6	1									9
Federal.....		19			11	2	1					33
American.....	47	95	1		4	4	1	1				153
Trident.....		7		1								8
Keystone.....	1											1
Arctic.....									1			1
Neptune.....	1											1
Totals.....	371	7,185	81	117	1,029	332	286	68	87	33	65	9,654

Table No. 12. Meters Salvaged in 1950.

MAKE.	DIAMETER IN INCHES.							Total.
	$\frac{5}{8}$	$\frac{3}{4}$	1	$1\frac{1}{2}$	2	3	4	
Hersey Disc.....	433	7	6	8	8	10	...	472
Watch Dog.....	2,229	150	101	6	1	...	...	2,487
Worthington Disc.....	460	...	...	3	...	...	...	463
King.....	416	10	2	3	...	...	...	431
American.....	120	32	...	...	...	...	...	152
Crown.....	1	1	1	1	1	1	1	7
Keystone.....	...	1	...	...	...	...	...	1
Lambert.....	1	4	7	...	1	...	...	13
Federal.....	37	...	...	...	...	...	...	37
Nash.....	11	...	1	...	1	...	...	13
Trident.....	9	...	...	...	...	...	...	9
Totals.....	3,717	205	118	21	12	11	1	4,085

TABLE I.

Showing Length of Water Pipe and Connections Owned and Operated by Public Works Department, Water Division, Water Services, and Number of Valves in Same, December 31, 1950.

DIAMETER OF PIPE IN INCHES.																	
48	42	40	36	30	24	20	16	14	12	10	8	6	4	3	2	Total.	
Length owned and operated, December 31, 1949.....																	
55,595	16,191	9,599	30,238	75,843	89,285	108,061	306,580	285	1,843,418	449,511	1,245,141	948,928	61,907	12,486	6,509	5,319,547	
26	4	5	31	50	75	71	768	14	5,229	1,577	4,608	3,107	547	19	18	16,149	
60	5	10	35	113	84	53	101	101	64	1	5	1	1	1	13	545	
11	5	6	11	33	37	52	76	76	166	40	203	111	66	9	5	861	
Lengths laid and relaid during 1950..																	
				25			306		4,285		15,525	9	142			20,292	
Gate valves in same.....																	
							1	1	16		51			1		69	
Air valves in same.....																	
Blowoffs in same.....																	
Lengths abandoned in 1950.....																	
				25			272		1,078	617	2,202	9,945	336	142	1	14,617	
Gate valves in same.....																	
									4	2	5	33				45	
Air valves in same.....																	
Blowoffs in same.....																	
Length owned and operated, December 31, 1950, including high pressure fire service.....																	
55,595	16,191	9,599	30,238	75,843	89,285	108,061	366,584	285	1,846,717	448,894	1,258,373	938,992	61,713	12,344	6,509	5,325,223	
26	4	5	31	50	75	71	769	14	5,241	1,575	4,654	3,074	548	18	18	16,173	
60	5	10	35	113	84	53	101	101	64	1	5	1	1	1	13	545	
11	5	6	11	33	37	52	76	76	166	40	203	141	66	9	5	861	
High pressure fire service.....																	
						20,140	46,953		31,756							98,849	

1,008.564 miles in system, including high pressure fire service.
18,721 miles in high pressure fire service.

Financial Transactions, Water Service, 1950.

Cash balance from 1949		\$696,628 72	
Receipts:			
Water rates and services	\$4,693,467 69		
Tax titles — water	21,232 42		
		<u>4,714,700 11</u>	
		\$5,411,328 83	
Expenditures from revenue:			
Pensions and annuities	\$39,247 91		
Current expenses and extensions	2,349,060 88		
Collecting Department	174,781 30		
Auditing Department	—		
Refunded water rates	678 20		
Refunded water collections	—		
Refunded water tax titles	—		
Metropolitan assessment	1,661,063 28		
	<u>\$4,224,831 57</u>		
Transfer of 1949 surplus to redemption of city loans	632,547 10		
		<u>4,857,378 67</u>	
		\$553,950 16	
Expenditures from debt account:			
Boston water debt	\$36,000 00		
Interest on loans	5,518 75		
		<u>41,518 75</u>	
Cash balance, December 31, 1950		\$512,431 41	
Cash forwarded to 1951		<u>192,358 80</u>	
Surplus on hand, December 31, 1950		<u>\$320,072 61</u>	
Loan account:			
Balance outstanding, January 1, 1950	\$192,000 00		
1950 payment on Boston water debt	36,000 00		
	<u></u>		
Balance outstanding, December 31, 1950		<u>\$156,000 00</u>	
Construction account:			
Extensions of mains (from revenue)			
Cost of construction, December 31, 1950	\$24,603,362 40		
Cost of construction, December 31, 1949	24,594,120 41		
	<u></u>		
Increase in plant cost during 1950		<u>\$9,241 99</u>	
Cost of existing works, December 31, 1950:			
Pipe yards and buildings *	\$84,332 16		
Engineering expense	57,873 58		
Distribution system †	24,222,478 36		
Hyde Park water works	175,000 00		
	<u></u>	\$24,539,684 10	
High pressure fire system ‡		<u>2,293,316 75</u>	
		<u>\$26,833,000 85</u>	

* \$10,500 deducted on account of abolishment of Charlestown yard.

† Includes \$155,023.89 expended on high pressure fire system in 1925, 1926, 1931, 1932, 1933.

‡ \$33,850.96 deducted from cost of high pressure fire system on account of abandonment of pumping station, Battery street.

Shutting Off and Turning On Water in 1950.

Number of shutoffs for repairs	7,299
Number of premises turned on after repairs	6,593
Number of shutoffs for vacancy	265
Number of premises turned on for occupancy	111
Number of premises shut off for nonpayment of water rates	8
Number of premises turned on again after being shut off for nonpayment	11
Number of premises shut off on account of waste	1
Number of premises turned on again after being shut off for waste	0
Number of new service pipes turned on for the first time	416
<hr/>	
Total number of times water was shut off or turned on	<u>14,704</u>

Table No. II. High Pressure Fire Service.

Showing Lengths of Water Pipes, Connections, Hydrants and Valves in Same, December 31, 1950.

	20-Inch.	16-Inch.	12-Inch.	8-Inch.	6-Inch.	Total.
Length owned and operated, December 31, 1949.....	20,140	46,953	31,756	.....	.....	98,849
Gates in same.....	.....	201	144	502	.....	847
Blowoffs in same.. ..	.....	.....	.....	.....	6	6
Length owned and operated, December 31, 1950.....	20,140	46,953	31,756	.....	.....	98,849
Gate valves in same.....	.....	201	144	502	.....	847
Blowoffs in same.....	.....	.....	.....	.....	6	6
High pressure fire hydrants.....	.....	.....	.....	.....	.....	505

18.72 miles of mains in system.

WATERWORKS STATISTICS, CITY OF BOSTON.
FOR THE FISCAL YEAR ENDING DECEMBER 31, 1950.

Mains.

Kind of pipe: cast-iron, wrought-iron, steel.
Size, 2-inch to 48-inch.
Extended, miles, 1.074.
Size enlarged, miles, none.
Total miles now in use, 1,008.564.
Public hydrants added, 19.
Public hydrants now in use, 12,372.
Stop gates added, 24.
Stop gates now in use, 16,173.
Stop gates smaller than 4-inch, 36.
Number of blowoffs, 861.
Range of pressure on mains, 30 to 90 pounds.

Services.

Kind of pipe and size: lead and lead-lined, $\frac{1}{2}$ -inch; cast-iron, 2-inch to 16-inch; wrought-iron and cement-lined, $\frac{3}{4}$ -inch to 2-inch; brass and copper, $\frac{5}{8}$ -inch to 2 $\frac{1}{2}$ -inch.
Total service taps now in use 103,283:

Cost of Replacement of Main Pipe, 1950.

Street.	Location.	District.	Size. (Inches.)	Feet.	Material.	Labor.	Inspection.	Original Size. (Inches.)	Feet.	Contract Cost.	Total Cost.	Contractor or Other Agency.
Prescott st.	Bet. Frankfort and Orleans sts.	E. Boston	12	272	\$29 68	.....	\$49 12	16	272	*	\$78 80	J. Barletta Company
Orleans st.	Bet. Prescott and Putnam sts.	E. Boston	8	196	1,304 91	\$45 00	113 94	12	196	*	1,463 85	J. Barletta Company
Byron st.	Bet. Cowper and Coleridge sts.	E. Boston	12	137	.....	.....	.....	.....	137	\$500 00	500 00	J. Botti & Son
Newark st.	Bet. Cedar and Merton sts....	Roxbury	8	92	374 19	45 00	50 64	10	92	672 00	1,141 83	Carriere Company
Riverside sq.	From Arlington st. and Metropolitan av.	Hyde Park	8	336	915 43	44 44	12 66	4	336	996 00	1,908 53	Baker & Co.
Lakeville rd.	Cor. Jamaicaaway et.	W. Roxbury	8	14	107 96	.....	12 66	6	14	78 00	198 62	Bagarella Cons. Co.
Wren st.	Bet. Martin and Robin sts....	W. Roxbury	12	238	1,152 40	91 95	75 96	6	238	841 63	2,161 94	J. Capone Company
Emmonsdaie rd.	Bet. Linnet and Howitt sts....	W. Roxbury	8	535	1,836 11	146 32	126 60	6	535	1,722 88	3,831 91	J. Capone Company
Allenwood st.	Bet. Anawan av. and Pelton st.	W. Roxbury	8	336	811 72	.....	.....	.....	336	1,298 68	2,110 40	J. Capone Company
Stratford st.	Bet. Anawan av. and Kenneth st.	W. Roxbury	8	514	2,772 58	191 25	164 58	6	514	1,813 98	4,942 39	J. Capone Company
Meredith st.	Bet. Clement av. and Kenneth st.	W. Roxbury	8	581	2,201 45	137 00	164 58	6	581	1,997 63	4,500 66	J. Capone Company
Clement av.	Bet. Meredith and Kenneth sts.	W. Roxbury	8	791	3,260 34	.....	37 98	6	791	2,759 23	6,057 55	J. Capone Company
March av.	Bet. Bellevue and Park sts....	W. Roxbury	8	360	1,058 72	101 25	113 94	6	360	1,258 48	2,532 39	J. Capone Company
Maywood st.	Bet. Warren st. and Blue Hill av.	Roxbury	8	1,260	5,146 80	474 00	316 50	6	1,260	8,407 13	14,344 43	Baker & Co. and C. Russo
Maywood terrace...	From Maywood st.	Roxbury	4	142	369 77	67 50	37 98	3	142	876 00	1,351 25	Baker & Co. and C. Russo
Norwell st.	Bet. Talbot av. and Park st....	Dorchester	12	869	6,733 33	396 10	253 20	6	869	4,092 99	11,475 62	H. DiTullio & Sons
Wheatland av.	Cor. Norwell st.	Dorchester	8	22	.....	.....	12 66	8	22	.....	.....	H. DiTullio & Sons
Wheatland av.	Cor. Norwell st.	Dorchester	6	9	.....	.....	.....	6	9	146 01	158 67	H. DiTullio & Sons

Bowdoin av.....	Bet. Bowdoin and Eldon sts...	Dorchester	12	275	8,177 71	419 00	195 12	8	275	8,893 71	17,895 57	Il. DiTullio & Sons
Bowdoin av.....	Bet. Bowdoin and Eldon sts...	Dorchester	8	1,635	.....	.....	.....	8	1,635	.....	.....	Il. DiTullio & Sons
Mt. Bowdoin Green..	From Bowdoin av.....	Dorchester	8	35	.....	.....	12 66	6	35	161 85	177 51	Il. DiTullio & Sons
Nottingham st.....	From Bowdoin av.....	Dorchester	8	41	.....	.....	26 32	6	41	297 24	233 56	Il. DiTullio & Sons
Park Drive.....	Bet. Beacon st. and Brookline av.	Roxbury	12	105	897 12	22 59	63 30	12	105	750 09	1,702 92	A. Singarella & Son
Southampton st.....	At N. Y., N. H. & H. R.R. Bridge	Roxbury	30	25	149 86	.....	37 98	30	25	.....	187 84	Baker & Co.
Washington st.....	Bet. Morton and River sts....	Dorchester	12	189	.....	23 10	152 56	12	189	*	175 65	Damos Brothers, Metropolitan Water Works
Greenwood st.....	Bet. Ellington and Erie sts....	Dorchester	8	270	1,172 53	67 50	37 98	6	270	1,101 42	2,382 13	Baker & Co.
Ellington st.....	Bet. Greenwood st. and Blue Hill av.	Dorchester	8	1,894	9,989 40	573 75	392 16	6	1,894	9,180 18	20,136 09	Baker & Co.
Eutaw st.....	Bet. Brooks and White sts....	E. Boston	8	194	2,261 19	77 96	30 73	6	194	1,370 05	3,739 94	R. A. Bucella Cons. Co.
Putnam st.....	Bet. Condon and Trenton sts....	E. Boston	12	772	6,823 56	311 86	259 13	6	772	5,205 24	12,601 19	R. A. Bucella Cons. Co.
Putnam st.....	Bet. Condon and Trenton sts....	E. Boston	8	237	.....	.....	.....	6	237	.....	.....	R. A. Bucella Cons. Co.
White st.....	Bet. Eutaw and Trenton sts....	E. Boston	12	556	2,469 57	274 31	155 17	6	556	2,557 45	5,455 50	R. A. Bucella Cons. Co.
Pilgrim rd.....	Bet. Francis st. and Deaconess rd.	Roxbury	8	266	2,047 49	32 59	284 82	6	266	1,673 13	4,038 03	R. A. Bucella Cons. Co.
Cranford st.....	Bet. Floydell and Heath sts....	Roxbury	.....	.....	.....	.....	.....	12	250	.....	.....	Water Yard
Cranford st.....	Bet. Floydell and Heath sts....	Roxbury	.....	.....	.....	.....	.....	8	259	.....	.....	Water Yard
Basswood st.....	Bet. Huntington av. and Cranford st.	Roxbury	.....	.....	.....	.....	.....	12	209	.....	.....	Water Yard
Floydell st.....	Bet. Huntington av. and Cranford st.	Roxbury	.....	.....	.....	.....	.....	6	179	.....	.....	Water Yard
Short st.....	Bet. Cowper and Coleridge sts.	E. Boston	8	50	292 80	258 75	82 29	8	50	*	633 84	J. Botti Company
East Dedham st.....	Bet. Wash. st. and Harrison av.	City	.....	.....	939 68	.....	.....	10	525	.....	939 68	Water Yard
Totals.....	.....	.....	.....	13,222	\$63,266 30	\$3,831 13	\$3,483 92	.....	14,617	\$58,838 25	\$129,419 60	.....

* Petitioner's expense.

Cost of Extension of Main Pipe, 1950.

Street.	Location.	District.	Size (Inches.)	Feet.	Material.	Labor.	Inspec- tion.	Contract Cost.	Total Cost.	Contractor or Other Agency.
Andria rd.....	Bet. George st. and dead end.....	Hyde Park	8	236	\$1,021 09	\$11 25	\$37 98	\$1,130 50	\$2,190 82	J. Susi & Sons Co.
Rustlewood rd.....	Bet. Jamaica way and Lakeville st....	W. Roxbury	8	383	2,279 06	29 52	88 62	1,308 25	3,703 45	Bagarella Construction Co.
Polonae Street Ext.....	From Jennett av.....	W. Roxbury	8	258	917 01	16 88	75 96	665 95	1,675 80	Bagarella Construction Co.
Horace st.....	Bet. Harmony and Moore sts.....	E. Boston	8	374	1,784 26	56 25	101 28	849 59	2,791 38	N. Bevilacqua & Son
Harmony st.....	Bet. Horace and Bennington sts.....	E. Boston	8	132	312 50	.....	63 30	409 66	785 46	N. Bevilacqua & Son
Adams st.....	From River st.....	W. Roxbury	8	191	1,018 23	78 75	63 03	749 03	1,909 04	J. Capone Company
Sherman st.....	Bet. Hawthorne and Poplar sts.....	W. Roxbury	12	196	1,380 09	67 50	50 64	543 75	2,041 98	J. Capone Company
Hasea st.....	Bet. Almont and Mattapan sts.....	Dorchester	8	336	1,764 74	.....	63 03	1,951 43	3,779 20	Baker & Co.
Vincent rd.....	Bet. Veterans of Foreign Wars Park- way and Morey rd.	W. Roxbury	8	247	634 31	67 50	37 98	1,355 00	2,094 79	Baker & Co.
Latin rd.....	Bet. St. Theresa av. and dead end....	W. Roxbury	8	364	1,342 39	67 50	37 98	2,105 00	3,552 87	Baker & Co.
Porter st.....	Bet. Cottage and Venice sts.....	E. Boston	12	57	270 89	.....	113 94	*	384 83	Farina Brothers Company
Old Colony Parkway.....	.....	Dorchester	8	142	433 19	.....	37 98	900 00	1,371 17	J. Susi & Sons Co.
Stimson st.....	Bet. Vogel and Stimson sts.....	W. Roxbury	12	322	2,156 51	.....	25 32	694 00	2,875 83	C. Russo & Co.

Salman st.....	Bet. Stimson st. and Upland rd.....	W. Roxbury	8	660	3,116 15	.....	37 98	1,317 80	4,471 93	C. Russo & Co.
Condit st.....	Bet. Hamilton st. and Belle ave.....	W. Roxbury	12	296	1,995 46	.....	25 32	1,120 39	3,141 17	C. Russo & Co.
Brook Farm rd.....	Bet. Lyall st. and Veterans of Foreign Wars Parkway.	W. Roxbury	8	48	144 86	.....	12 66	278 50	436 02	Taaffe Company
Tobin rd.....	From Washington st.....	W. Roxbury	8	36	.....	.....	.....	265 00	265 00	Baker & Co.
Claine av.....	From Neponset av.....	W. Roxbury	8	112	287 50	90 00	23 01	670 00	1,070 51	James A. Freaney, Inc.
Woodglen rd.....	From Washington st.....	Hyde Park	8	64	.....	.....	.....	363 64	363 64	Taaffe Company
Garfield av.....	From Washington st.....	Hyde Park	8	24	495 00	.....	12 66	136 36	644 02	Taaffe Company
Badger rd.....	Bet. Washington st. and Truman Highway.	Hyde Park	8	96	229 00	.....	12 66	475 00	716 66	Susi & Co.
Shrewsbury rd.....	Bet. Centre st. and Veterans of Foreign Wars Parkway.	W. Roxbury	8	219	.....	.....	.....	514 75	514 75	Baker & Co.
Buchanan rd.....	Bet. Alward and Truman rds.....	W. Roxbury	8	261	1,310 07	.....	37 98	639 33	1,987 38	Taaffe Company
Cottage av.....	From Washington st.....	W. Roxbury	8	181	589 94	.....	25 32	574 25	1,189 51	J. Capone Company
Vogel st.....	Bet. Stimson st. and Upland rd.....	W. Roxbury	8	958	4,196 42	.....	37 98	1,886 67	6,121 07	C. Russo & Co.
Bellevue Tower rd.....	From Bellevue Hill rd.....	W. Roxbury	16	306	1,793 09	.....	101 28	1,054 36	2,948 73	J. Capone Company
Wenlock rd.....	From Gallivan Boulevard.....	Dorchester	8	252	1,036 17	.....	12 66	910 00	1,958 83	D'Amico Company
Jamaicaway ct.....	Bet. Jamaica way and Lakeville st.....	W. Roxbury	8	289	1,366 39	33 35	75 96	840 05	2,315 75	Bagarella Construction Co.
	Totals.....	7,070	\$31,874 32	\$518 50	\$1,212 51	\$23,698 26	\$37,303 59	

* Petitioner's expense.

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